Credit: USGS

2018 KĪLAUEA DISASTER ECONOMIC RECOVERY PLAN

Prepared for the County of Hawai‘i
By the Institute for Sustainable Development
Funded by the County of Hawai‘i and the U.S. Economic Development Administration
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Institute for Sustainable Development

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Preface

The County of Hawai‘i is pleased to present the 2018 Kīlauea Disaster Economic Recovery Plan. More than 100 business and community leaders provided extensive input into the development of this plan, which is intended to serve as a roadmap for businesses in the Puna district and across the Island of Hawai‘i to continue the process of recovering from the 2018 Kīlauea Eruption. As with all significant disasters, recovery will take years; yet recovery is anticipated to lead to improved business climate and emerging opportunities.

Much of the information gathering, data analysis, and development of this plan occurred from 2019 into early 2020. The rollout of the Economic Recovery Plan was delayed several months by the onset of an event that caused even greater economic disruption – the Coronavirus Pandemic of 2020 (COVID-19). The severity of the economic impacts and long-term changes to the island's business community is a story currently unfolding, with no projected timeline or certainty as to future outcomes. Given this heightened uncertainty, rather than proceed with a comprehensive rewrite of the Economic Recovery Plan, the reader is encouraged to seek to understand the business community's strengths, weaknesses, threats and opportunities; the associated analysis of industries and markets; and the strategic recommendations. Moving forward, the business community, along with government partners at the federal, state and county levels, must all work together to build a successful economic recovery.

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The Kīlauea eruption, along with damage from Hurricane Lane (which peaked as a Category 5 hurricane that affected the island simultaneously, mostly from heavy rainfall), caused more than $974.9 million in impacts. Prior to COVID-19, these events were the worst series of economic disasters to strike the island in recent history. In response, the County of Hawai'i, with the assistance of the U.S. Economic Development Administration, commissioned this Economic Recovery Plan. The impacts of these two events affected tourism and visitor services, disturbed supply chains, damaged infrastructure, directly impacted real estate, and shocked consumers island-wide.

Credit: Nathan Kam

Before the Kīlauea eruption, the island's economy was on an upward trajectory dating back to 2015. In the first four months of 2018, businesses had been ramping up for what was forecast to be a record-breaking year of tourism and population growth. As a result of the eruption and hurricane, more than 2,950 jobs were lost from the island's workforce over 12 months, while the state lost 4,100 jobs over the same period. Numerous small businesses closed or downsized.

This Economic Recovery Plan is designed to serve as a structured, implementable road map for the Island of Hawai'i's business recovery, business development, job creation, and both private and public investment. It identifies goals, objectives, strategies, and recommendations, and near- and long-term implementation actions. It also provides funding strategies to help restore and enhance what was lost in the economy due to the 2018 disasters. This document is intended to assist the island in building economic resiliency for the future.

The five major goals, identified by the island's business community during recovery outreach and engagement, are:

Goal #1 – Respect and embrace the island's natural and cultural resources
Goal #2 – Address the directly impacted area's economic recovery
Goal #3 – Address recovery from island-wide impacts
Goal #4 – Promote future resilience and sustainability
Goal #5 – Develop the island's business and entrepreneurial support system

Based on input, this plan was organized to further break down these goals into objectives. While there was broad consensus about the over-arching goals, there were significant differences among business stakeholders about which objectives to prioritize and how to allocate resources to achieve success. In response, the plan offers different alternatives to pursue followed by strategic recommendations.

In the development of the plan, businesses and community stakeholders brought to light multiple philosophies, scenarios, and strategies for recovery. The approaches ranged from specific place-based recovery strategies to island-wide and sector-based initiatives. The preparation of this document applied technical frameworks and lessons learned from other disaster recovery processes. A strengths, weaknesses, opportunities, and threats (SWOT) analysis was conducted to further guide this approach.

Two key insights emerged from this process to help shape the plan. First, business areas and economic effects were not limited to the Puna district, the location of the eruption. Therefore, this plan considers both the recovery of the directly impacted communities and the economic recovery needs of the entire island. Second, for this framework to be sustainable and resilient for the future, it cannot simply address short-term losses. Economic recovery also means creating more resilient support systems and businesses for the future.

The core strength of the Island of Hawai'i for most businesses, residents, and visitors is its abundant natural resources and cultural assets of its people. The resonating connection to the 'āina (land) and 'ohana (family) drives all elements of the island's society. This deep connection to the land originates from the earliest native Hawaiians and their land use principles, founded on the sustainable and self-sufficient ahupua'a – the traditional Hawaiian system of land use and division, extending from mountain to sea. This 'āina-first value system permeates today's modern society and is manifested in multiple ways, from farm-to-table agriculture to a wide range of products and services that derive their value from the island's bounty and people. It only makes sense that for an economic recovery strategy to be successful, it should focus on rejuvenating businesses and building the economy based on this integrated respect for the island's natural and cultural resources and its 'ohana.

The result is a plan that is tailored to the aspirations of the island residents and businesses, including its unique social fabric and the opportunities and constraints of its geography. This plan builds from the community up, and places small businesses and start-ups at the heart of the recovery strategies that depend on the tradition of collaboration and communication. This core approach is bolstered by developing supporting essential infrastructure, connectivity, communications, workforce development, and resilience systems to build economies of scale and strengthen positive connections.

Extensive input from business community stakeholders informed the 2016-2020 Hawai'i County Comprehensive Economic Strategy (CEDS)[1], which was led and completed by the Hawai'i Island Economic Development Board. The CEDS' strengths, weaknesses, opportunities, and threats (SWOT) exercise identified "collaboration" as an economic strength. While this asset seems strange in an economic plan, it is a natural outcome of the island's rural agricultural past and the core value of 'ohana in Hawaiian culture.

Economic Recovery Strategies at a Glance

Figure 1: Economic Recovery Strategies

No single silver bullet strategy can address the range of issues raised in developing this plan. Rather, as Figure 1 illustrates, interlocking strategies should be pursued to achieve desired goals. In the directly impacted area, the town of Pāhoa plays an important role as an anchor and focal point of economic activity. Other important focal commercial points include the villages of Kea'au and Volcano. The private sector is already taking the lead to revitalize these villages and adjoining neighborhoods, developing spaces for new businesses, and refreshing businesses related to tourism, agriculture, consumer products, health and wellness, clean energy and other products and services.

[1] http://records.hawaiicounty.gov/weblink/1/edoc/84981/2016-2020%20Hawaii%20County%20Comprehensive%20Economic%20Development%20Strategy.pdf

Furthermore, the economy of the Puna district is inextricably linked to districts and communities island-wide. The relative affordability of housing in Puna has driven a significant influx of residents yet the availability of services and jobs found in the district remain limited. The result is that many residents commute to Hilo for services and/or work, or as far as West Hawai'i for work in resorts. It is with this understanding the plan calls for public investment in infrastructure and business support services, not only to assist the directly affected district but to strengthen the economy island-wide.

On the "demand" side, the population of the Island of Hawai'i is 197,658 and its rural communities range from neighborhoods of just a few households to 46,284 in Hilo[2]. Therefore, relying on the purchasing power of residents alone will not generate enough economic activity to lift the income of all households. In comparison, over 1.8 million people visited the island in 2017. While the foundation of this plan is locally oriented and community-based, a critical factor for tourism and overall business recovery is how the island is perceived externally. Unfortunately, because of media coverage of the disasters, perceptions developed that most of the island was affected and at risk. The eruption inundated 14 square miles of the 4,028-square-mile island, though earthquakes and vog affected larger areas. This is a key reason why strategic communications, marketing, and outreach must be a component of recovery and resilience. However, communications to key stakeholders both on- and off-island need to be nuanced and aligned with the island's commitment to preserving and promoting the sustainability of its natural and cultural resources.

There are many opportunities to support economic recovery by specific industry and economic sectors. Tourism is the largest sector of the economy. Cultivating a greater diversity of attractions and product can reinforce its appeal, while also increasing the island's economic resilience and sustainability. Such areas of growth and development can include value-added agriculture, health and wellness, food and beverage, restaurants, creative arts, and other businesses grounded in the stewardship of the island's natural and cultural assets.

This recovery process requires a balance between making incremental steps along the way that do not overtax existing capacity, while keeping in mind long-term goals for economic and environmental sustainability and resilience. Individually, each strategy will deliver benefits; collectively, the strategies – to develop a more diversified economy, an enhanced support system for value-added job creation and business development, and infrastructure that can withstand future extreme weather or geological events – will help to position the island for a more resilient future.

[2] Source: DP05 ACS Demographic and Housing Estimates, American Community Survey 2018, CS 5-Year Estimates.

Economic recovery from major disasters, such as the 2018 Kīlauea eruption and Hurricane Lane, will not happen overnight. Limited public and private capital will need to be invested wisely to address losses in infrastructure, property, equipment, and inventory. Supportive initiatives to retain existing businesses, along with investments in entrepreneurship and new business development, should leverage the business community's capacity. Relevant workforce development can help ensure businesses have trained employees and provide meaningful employment opportunities for residents. Lastly, enhanced communication strategies to reach customers and visitors will help to ensure businesses and communities thrive. This plan is designed to support the economic recovery through the identification of key strategies, solutions, actions, and funding sources to help make for a resilient recovery and enhance economic resiliency.

Overall Methodology

The development of this plan incorporates views of a wide variety of businesses and industry associations, as well as organizations that provide support to the economic development ecosystem throughout the Puna district, the island, and state. A survey was made available over a two-month period in summer 2019 to capture views of individuals and business owners. The findings of an earlier survey of agricultural businesses, immediately after the disaster in fall 2018, were also analyzed. The research incorporated both a quantitative and qualitative approach to analyzing the economic impacts of the 2018 disaster and studied the disaster within the broader context of the Island of Hawai'i's development, business clusters, and supply chains.

The research included an extensive review of relevant reports and plans. Information was collected from the surveys of businesses, in-depth interviews, and from official government sources. Business stakeholders were convened to share and seek feedback on findings, providing valued input and further direction in the development of the plan.

The following guidelines surfaced and were used to evaluate potential strategies:

- The Island of Hawai'i businesses and government should build on what already exists and not try to reinvent the wheel. Well-researched recommendations surfaced in past plans with many initiatives under way.

- Where there are gaps and limitations, recognize that everything does not need to be addressed all at once but can be financed or addressed over time.

- Economic recovery will take time. Disasters may occur within a relatively short period of time and impact what may have taken years, decades, or even centuries to create. These

disaster events not only prompt physical and economic damage but also cause emotional trauma. The economic recovery process needs to take these factors into account.

- Resiliency and sustainability are core principles – strategies and projects should enhance the short- and long-term future of the community meeting a balance between people, planet, and profits.

- Respect for the diverse viewpoints and the values of the community.

- Prioritize recurring needs and desires of local businesses wherever possible while recognizing what is feasible and where there are existing strengths and assets.

Many of the ideas and recommendations presented in this plan are based on the knowledge and insights of local businesses as well as local and state organizations. This plan provides a framework and point of reference for key goals and strategies. As more information becomes available and the work progresses, the plan may be adjusted to incorporate additional data and analysis.

Four Months of Eruptive Activity

The 2018 Kīlauea eruption began May 3, 2018, with a fissure opening on Mohala Street in Leilani Estates. This was preceded by the movement of magma downrift from Puʻu ʻŌʻō on the Middle East Rift Zone – where on-going eruptive activity had occurred during the past 35 years – and the collapse of the Puʻu ʻŌʻō crater. The eruption also drained magma from the summit reservoir, causing the Halemaʻumaʻu crater at the Kīlauea summit to increase in depth from 280 feet to about 1,600 feet. Presidential Disaster Declaration FEMA-4366-DR-HI was approved on May 8, 2018, and the eruption continued through August 2018, encompassing the following impacts:

- The volcanic eruption lasted for about four months. The volume of lava emitted and the associated hazards, including ash, tephra, sulfur dioxide, laze and vog, impacted the Island of Hawaiʻi residents and businesses.

- Neighborhoods – including Kapoho Beach Lots, Kapoho Vacationland, Lanipuna Gardens and Leilani Estates – were partially or completely inundated by lava; the Kua O Ka Lā Public Charter School and Ahalanui Beach Park were destroyed; and Isaac Hale Beach Park was damaged.

- The village of Volcano experienced thousands of earthquakes over a period of about three months that, in addition to the 162-day closure of Hawaiʻi Volcanoes National Park (HVNP), kept visitors away, creating a business "ghost town" effect during what would normally be peak tourism months.

- Inside HVNP, the Jaggar Museum was condemned due to structural damage. Several businesses located within the park that relied on visitors closed, as did long-standing island businesses that were reliant on tours to see active volcanic activity. The park had been the largest single attraction in the state, with approximately 2 million visitors per year on average. This was also highly significant for the town of Hilo, which had been the primary gateway to the volcano for visitors arriving via air and the harbor on cruise ships.

- Access to the Pohoiki boat ramp, a significant state facility used for commercial and subsistence fishing, was blocked by massive deposits of sand and pebbles because of lava entering the sea nearby.

- Economic impacts to Pāhoa were felt as tourism significantly dropped as well as the permanent loss of vacation rentals in Kapoho and elsewhere.

- While not subject to lava inundation, the western side of the island experienced months of increased vog. This led to thousands of visitors cancelling reservations. The uncertainty over what the volcano would do next caused major cancellations of group reservations at island hotels. Cruise ships adjusted several scheduled visits, resulting in hundreds of thousands of dollars in small business losses.

- Businesses reported that agricultural supply chains were disrupted, and a wide range of multiplier effects occurred as buying patterns changed significantly.

- The County lost vital real property tax income for inundated and isolated properties and incurred unplanned expenses for response and recovery.

- More than 2,950 people lost their jobs on the island over 12 months after the eruption began in May 2018.

- Farms reported losing $27.9 million in assets and sales.

- Tourism losses totaled an estimated $415 million on the island over a one-year period.

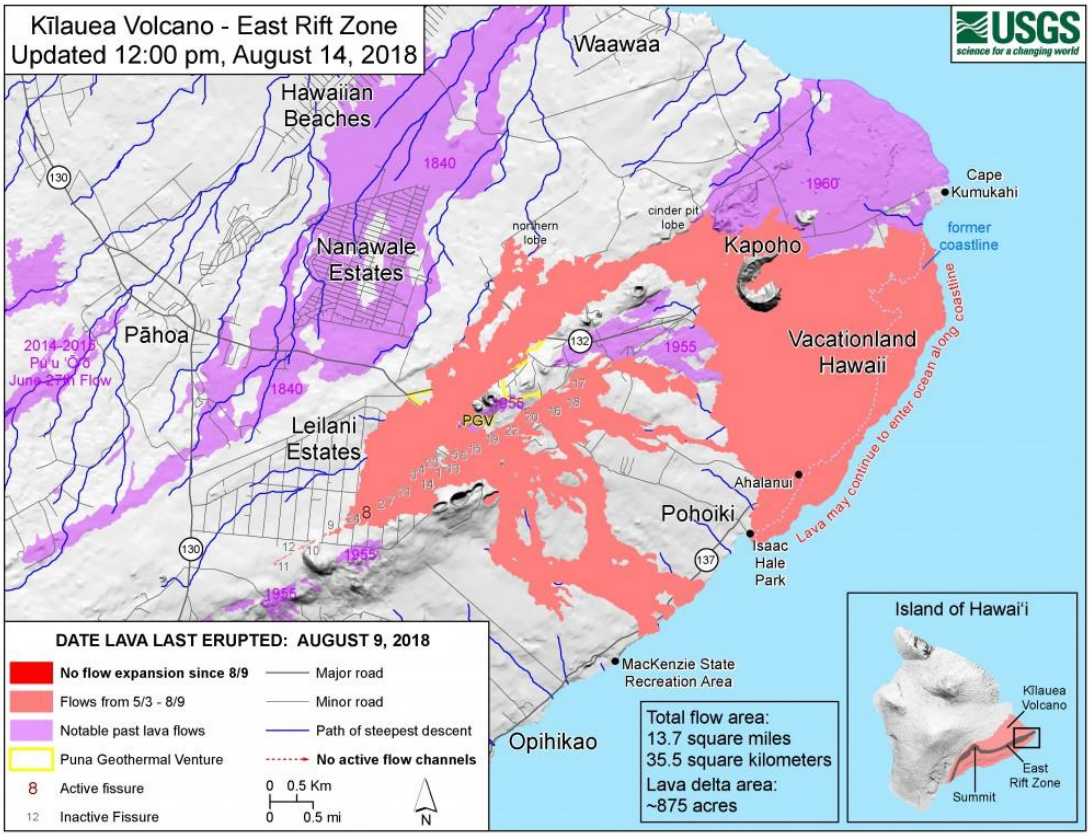


Figure 2: Impact Zone (Source: U.S. Geological Survey)

And the Rain Came

Overlapping economic impacts resulted with Hurricane Lane, which peaked as a Category 5 hurricane 320 miles off the southern tip of the Island of Hawai'i. Hurricane Lane impacted the east side of the Island of Hawai'i from August 22-29, 2018. Flooding caused the majority of damage. Lane was the second wettest storm in U.S. history with over 50 inches of rainfall recorded.

The State requested Federal assistance, noting that the island was already overwhelmed with the Kīlauea eruption. In a letter to President Donald Trump, Governor David Ige stated that physical damage to buildings, roads and infrastructure, as well as the cost of closing government facilities from Hurricane Lane, totaled nearly $6.2 million. This included debris cleanup ($196,400), roads and bridges damage ($3,913,310), public buildings ($202,275), and parks & other county facilities ($1,881,740).

In addition to the significant road damage and landslides, several sewage pumping stations were overwhelmed, causing more than nine million gallons of untreated sewage to be discharged around Hilo Bay. Ninety-two homes were affected, of which 29 had major damage.

Business losses from Hurricane Lane could not be distinguished from the Kīlauea eruption as earnings are reported monthly and the two disasters overlapped. However, some impacts during the period were notable:

- Visitor arrivals to the island were down by 85,913 people in August 2018 over the same month in 2017. Again, this is indistinguishable from the impacts of the volcanic eruption and Hurricane Lane.

- Unemployment was 3.0% in August and 3.2% in September 2018, higher as compared to 2.6% to 2.7% over the same months in 2017, but it is likely that the higher rate was due to the combined disasters.

Economic Baseline – An Overview

The goal of this Economic Baseline is to capture the Island of Hawai'i's economic trends prior to the lava flows and Hurricane Lane, and how these extreme events affected the economic trajectory of the Island of Hawai'i. This baseline will help to inform latter components of this plan: (1) to establish goals and objectives for the island's long-term economic recovery and sustainable development, and (2) to develop and prioritize strategies for realizing these goals and objectives.

In order to quantify the economic impacts of these events, the County commissioned the Institute for Sustainable Development (ISD), a 501(c)-3 non-profit research organization, to aid in the recovery effort. ISD was tasked to analyze existing data, provide a baseline of the trends before the eruption began, and identify how the events in question affected them.

Key findings from this baseline study include the following:

- **Housing and Property Values**: The County estimates that damage to the property tax base was $296 million. This involved 723 structures, including 612 homes, on 8,448 acres of land inundated by lava over a 14-square-mile area. This estimate does not include losses of home-based businesses, agricultural, and other commercial uses such as vacation rentals.

- **Loss of Jobs**: According to the State's Department of Business, Economic Development and Tourism (DBEDT) and the State Department of Labor & Industrial Relations (DLIR), 2,950 jobs on the island were lost over a one-year period from the start of the eruption in May 2018 to April 2019 as businesses reduced staff or closed their doors.

- **Tourism Sector Losses**: The 2018 disasters interrupted a period of high tourism growth, causing at least $415 million in lost revenue island-wide and $751 million in lost output statewide, according to projections based on data from the Hawai'i Tourism Authority, DBEDT and TZ Economics.

- **Agriculture Losses**: A study by the University of Hawai'i and State Department of Agriculture found that 46 farms were lost due to the eruption. Self-reported damage was at least $27.9 million. Twenty-five farms that were destroyed also had loans totaling $2.5 million, some of which became non-producing due to inaccessibility of properties after the lava flows, and damage to products and equipment. These statistics may not include continuing losses of sales as businesses remained closed.

- **Infrastructure**: The destruction or damage to County-owned infrastructure was

estimated by the County at $236 million, which included public roads, water infrastructure, and a park and portions of a second park. The state's Pohoiki Boat Ramp, used for both commercial and subsistence fishing, was filled in by massive amounts of newly formed black sand and pebbles.

Economic variable	Measure	Ave. 12-months ending April 2018	Ave. 12-months ending April 2019	Change	Percent change	12-months ending November 2019	Sources
Persons employed	Thousand	91,338	90,521	-817	-0.9	85,250	DLIR, DBEDT
Non-ag payrolls	Thousand	69,175	69,025	-150	-0.2	-0.2	DLIR, DBEDT
Unemployment rate	Percent	2.7	3.4	0.7	n.a.	3.6	DLIR, DBEDT
Notable job loss by industry							DLIR, DBEDT
Other (non-health, prof.) services	Jobs	2,192	2,100	-92	-4.2	2,100	
Accommodation	Jobs	6,325	6,075	-250	-4.0	6,542	
Food services & drinking places	Jobs	6,950	6,683	-267	-3.8	5,850	
Private building permit values							County of Hawai'i, DBEDT
New residential	Million $	295.6	293.4	-2.2	-0.8	276.0	
New commercial	Million $	49.3	62.0	12.7	25.8	73.7	
Additions and alterations	Million $	158.9	198.4	39.5	24.9	202.1	
Tourism totals							HTA, DBEDT
Visitor arrivals	Million	1.833	1.649	-0.184	-10.0	1.755	
Domestic	Million	1.336	1.266	-0.070	-5.2	1.346	
International	Million	0.497	0.383	-0.114	-22.9	0.409	
Visitor days	Million	13.347	12.413	-0.935	-7.0	12.866	
Visitor expenditure	Billion $	2.463	2.231	-0.232	-9.4	2.289	
Urban Hawaii CPI-U (March values)	1982-84=100	275.408	280.263	4.855	1.8	282.248	
Real visitor expenditure	Mil. March 2019$	2.506	2.231	-0.275	-11.0	2.273	

Figure 3: Compilation of Selected Economic Impacts – County of Hawai'i. (Source: Institute for Sustainable Development and TZ Economics)

While the entire state was affected by the federally-declared disasters in 2018, the brunt fell on a 14-square-mile area where some of the most vulnerable and under-served residents live in lower Puna, southeast of Kīlauea's East Rift Zone. This area has a higher percentage of low-and-moderate income residents, less access to critical infrastructure and services, and more people living "off the grid" than in any other part of the state. The cultural heritage of the Puna district and its value to the Native Hawaiian and other resident population is also historic and significant.

The lava flows triggered an island-wide economic downturn because of the damage to important assets and the dependency of the island on tourism and visitors. No physical damage was recorded by businesses on the west side of the island, yet many suffered shortages of customers and supply chain interruptions, according to interviews conducted by the Federal Emergency Management Agency (FEMA) immediately after the disaster, the 2019 Business Survey, and interviews conducted by the Institute for Sustainable Development in connection with this study. Different stresses were placed on public services and infrastructure as public safety, consumption, traffic patterns, customer behavior, and business expenditures were altered.

The nature of the disaster is somewhat unique and posed ongoing concerns about safety, specifically the time needed for a lava flow to cool off in relation to the built and natural environment. The result is that the island did not experience a short-term "repair dividend" boost of incoming aid, purchasing, repairs, and reconstruction that normally follows immediately after major disasters.

The Island of Hawai'i's recovery will benefit from trending (1) repair and replacement capital expenditures, (2) a positive long-term trend in visitor increases (despite pre-disaster trends in lower expenditures per visitor), (3) continued investment in infrastructure, alternative energy, healthcare, agriculture, aquaculture, and (4) start-ups and small business.

Economic Baseline Methodology

The research team undertook both a quantitative and qualitative approach to analyzing the economic impacts of the 2018 disasters and studied them within the broader context of the Island of Hawai'i's development. The 2018 Kīlauea eruption was the most recent shock in an eruption cycle that began on January 3, 1983, along the middle of the East Rift Zone, where there have been more than 60 eruptions over three decades (USGS 2019).

These eruptions have impacted the economic development of Ka'ū and Puna in multiple ways, affecting housing prices, infrastructure placement and investment, and the business industry and employment mix. While located in a small area on the east side of the island, the 2018 eruption also impacted the entire island as the western side experienced months of increased vog. Several cruise ships adjusted their plans and resulted in significant cancellations by groups and individual travelers. Businesses that catered to tourists and agricultural operations were impacted in multiple locations on the island, which caused multiplier effects throughout the economy.

As the most remote islands on Earth from the world's continents, the Hawaiian Islands have unique shipping, energy, infrastructure, and connectivity issues. Furthermore, the Island of Hawai'i lags behind the state as a whole on a number of key economic indicators, including

higher energy costs. The island ranks highest in the state in Asset Limited Income Constrained Employed (ALICE) households, has the lowest rank in educational attainment, and lowest per capita income. Even on the island, there are significant variations. The region where the 2018 Kīlauea eruption occurred lags behind the rest of the island on these indicators as well. This preexisting economic vulnerability has been compounded by the events of 2018.

Despite these weaknesses and vulnerabilities, the island is fortunate to have many unique assets and advantages. The natural beauty, the quality of life, the strong and vibrant culture and rich history of the people, and an inherent self-reliance and resilience as islanders are apparent. Some residents think of Kīlauea as the home of the goddess Pele and their culture and experience has helped them through difficulties that might have disrupted other communities more deeply.

There are multiple challenges affecting the ability to capture the economic baseline precisely. Direct costs are the easiest to see and quantify. The lava destroyed roads, houses, transmission lines, and other tangible assets. Initial estimates from the County totaled $236 million in damage to key assets. Initial business closures were relatively easy to quantify as well. Hawai‘i Volcanoes National Park was closed for four months, which represented at least $99.4 million in lost revenue directly. But there are multiple other costs that are indirect, intangible, or evolving.

The physical impact of the lava flows on the island were relatively small compared to the public perception of their extent. In fact, the physical damage was confined as less than 5% of the surface land area of the island. No physical damage was recorded on the western side of the island, yet residents reported suffering inconveniences, shortages of essential supplies, and declines in tourism and related business. Different stresses were placed on public services and infrastructure as public safety, consumption, traffic patterns, customer behavior and business expenditures were altered. These indirect costs are harder to quantify and attribute.

Another difficult issue to analyze is the effect of the disaster on different types of purchases. After disasters, local Gross Domestic Product (GDP) may increase as businesses and households replace damaged or destroyed housing, plants, property, equipment, and inventory. These capital expenditures may offset or mask significant downturns in normal operations. However following the Kīlauea eruption, the State and County of Hawai‘i issued numerous emergency proclamations that included a multi-month restriction on access to the impacted area. Such safety precautions not only affected the timing and disbursal of relief funds but also caused a lag in purchases, permit issuance, and construction.

An additional challenge is that disasters may alter the timing of purchases and the patterns of how purchases are made. In some cases, customers may hold off on their regularly scheduled transactions in one month then double up in a following month. Also, they may have made

purchases previously in Puna and other impacted communities, but because of disruptions they may now make these same purchases in Hilo. The result is that the over-all net effect may seem like zero, even though there are significant alterations of economic behavior underneath the aggregate numbers.

Finally, there may be ongoing effects that do not show up in the data. Consumer confidence may decline or preferences may change. Business decisions about relocating or significant investment decisions may not be immediately apparent. Initial calculations may be modified. It is difficult to capture the true socio-economic value of socially or environmentally significant impacts, such as the loss of the Pohoiki boat ramp. Community buy-in and approval is a tremendous economic asset that is inherently hard to price quantitatively, but without it, sustainable development is not feasible.

For these reasons, this baseline represents a one-year snapshot based on the information available for the period just prior to and including the eruption. Further details and trends must continue to be refined as the full effects of the disaster and responses to it unfold.

Economic Conditions

The eruption and hurricane affected the Island of Hawai‘i’s economy in multiple ways.

- The disasters interrupted the upward trajectory of the island’s economic growth, and caused at least $415 million in lost tourism revenue, and as much as $751 million in lost output statewide.

- The disasters affected the island’s asset base, with the destruction or damage to infrastructure assets preliminarily estimated at $236 million.

- Based on the combined factors affecting assets, income, and the tax base, the impact of the disasters was at least $796 million for the Island of Hawai‘i and its residents and businesses, and $1.183 billion statewide.

Employment and Workforce Participation

As can be seen in the figure below, prior to April 2018 the Island of Hawai‘i had enjoyed a positive trend line in employment. The unemployment rate had fallen in half dating from 2015. The disaster had an immediate impact in erasing the jobs gained since 2015, causing unemployment to rise to 3.9% on the island.

At the same time, total wage and salary jobs statewide as of April 2019 was 660,400, an increase of 4,300 jobs from April 2018. Furthermore, according to the University of Hawai'i's Economic Research Organization (UHERO), the labor force level in 2019 Q2 was 88.5, versus 2018 Q2 where the labor force level was 91.9. This is a year-over-year change of -3.7%.

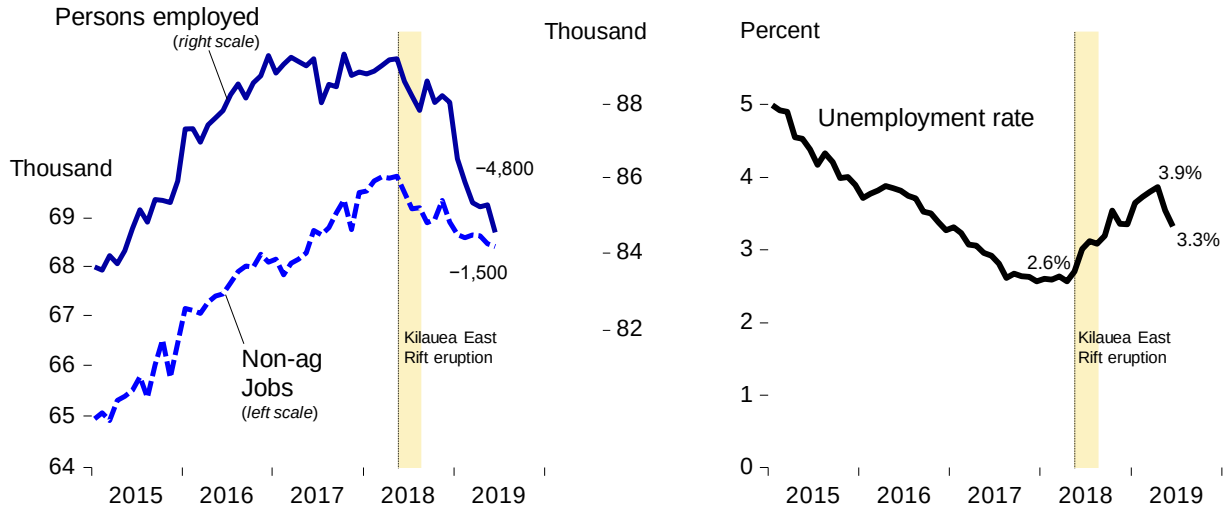


Figure 4: Unemployment Rates on Hawai'i Island (Source: Hawai'i DLIR, seasonal adjustment by Institute for Sustainable Development and TZ Economics)

This sudden jolt to the economy was felt across most sectors of the economy, leading to job losses for many tourism-related industries. The Island of Hawai'i job growth by industry reversed course between the first and second half 2018.

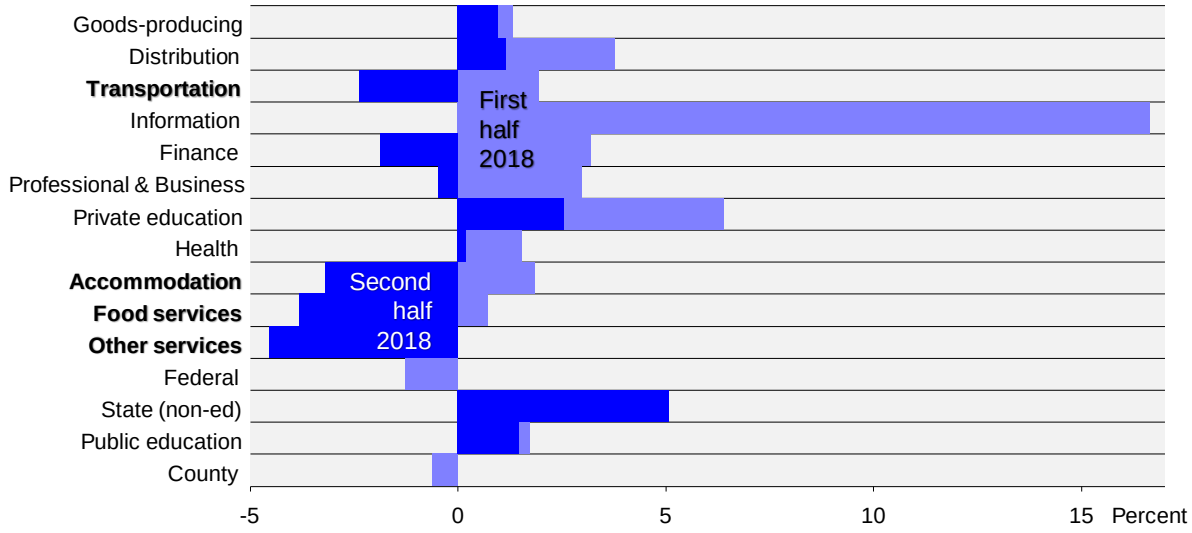


Figure 5: Job Growth and Losses by Industry (Source: Hawai'i DLIR, Hawai'i DBEDT, seasonal adjustment by Institute for Sustainable Development and TZ Economics)

Transportation, accommodation, and food services – industries directly related to tourism -- were hardest hit. In each case, they had been on a trajectory to add jobs in the first half of 2018 and reversed course in the second half of the year.

Income and Distress by Census Tract

As of 2018, the population of Puna was 46,664 with 21.2% of the population living below the poverty level, according to the U.S. Census American Community Survey's latest five-year estimates. For comparison, the average poverty rate was 9.9% for the state and 14.1% nationwide.

The Census tracts indicated in the following image represent the impacted areas of:

- Orchidland Estates-Ainaloa (210.03)
- Hawaiian Paradise Park (210.05)
- Upper Puna (210.10)
- Volcano (210.11)
- Kurtistown-Kea'au (210.13)
- Leilani Estates-Kapoho (211.01)
- Pāhoa (211.06)

Economic Distress Criteria—Primary Elements

	Region	U.S.	Threshold Calculations
2018 Unemployment Rate (5-Year ACS)	7.7	5.9	1.8
2018 Per Capita **Money** Income (5-Year ACS)	$22,895	$32,621	70.18%

Economic Distress Criteria—Geographic Components

	Unemp. Rate 2018 ACS	Threshold Calculation	PCMI 2018 ACS	Threshold Calculation
Tract 0210.03 Hawaii, HI	7.0	1.1	$19,788	60.7
Tract 0210.05 Hawaii, HI	4.1	-1.8	$24,729	75.8
Tract 0210.10 Hawaii, HI	8.6	2.7	$22,236	68.2
Tract 0210.11 Hawaii, HI	0.2	-5.7	$22,274	68.3
Tract 0210.13 Hawaii, HI	4.1	-1.8	$25,343	77.7
Tract 0211.01 Hawaii, HI	11.9	6	$29,072	89.1
Tract 0211.06 Hawaii, HI	16.6	10.7	$19,948	61.2

Sources: U.S. Bureaus of Census, Labor Statistics, and Economic Analysis; Calculations generated by StatsAmerica.

Figure 6: Economic Distress Criteria, U.S. Department of Commerce, StatsAmerica.gov

The primary focus of the data tool used above is to review the 24-month Unemployment Rate and how it measures as compared to nationwide averages. It measures:

Frequency: The Bureau of Labor Statistics releases monthly preliminary and revised unemployment data. Preliminary data are released toward the end of each month for the time two months prior.

Source: U.S. Bureau of Labor Statistics (BLS) files, for all U.S. counties and states, provide both revised and preliminary figures.

Calculation: A 24-month average takes the sum of the labor force and the sum of unemployed persons. Unemployment is then divided by the labor force to achieve the rate. The rate of unemployment is that portion of the total labor force that is unemployed.

Thresholds: Threshold calculations reflect the difference between the unemployment rate for the geographic area and the U.S. For example, the Pāhoa district has a 24-month rate of 16.6 and the U.S. rate is 10.7, the difference shown in the threshold column is 10.7—meaning it is 10.7 points higher than the U.S.

The graph below displays Real Per Capita Income in the County of Hawai‘i vs the State average.

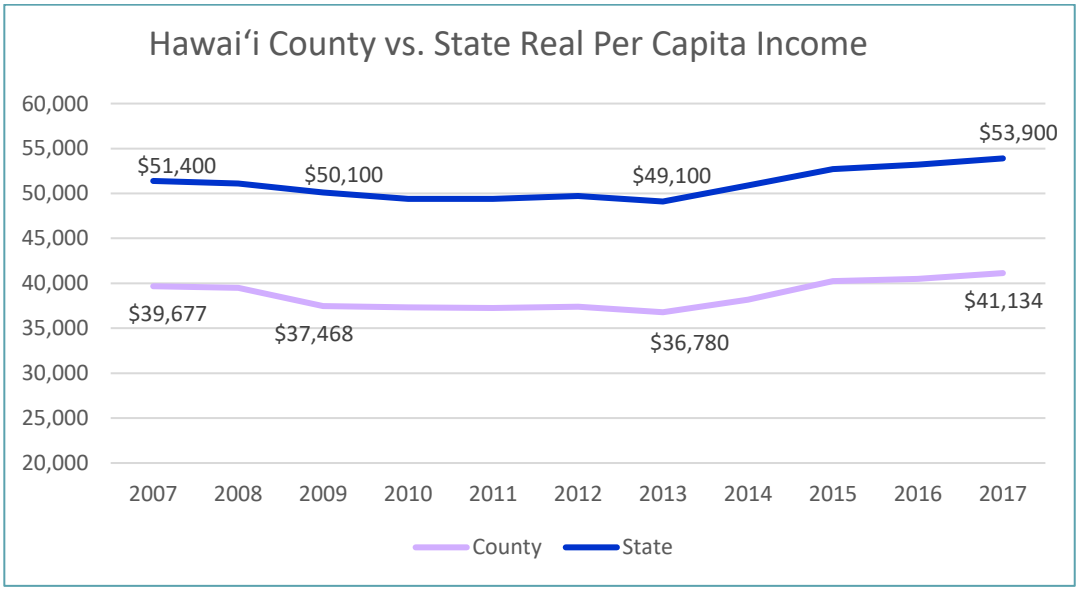


Figure 7: Comparison of Per Capita Income (Source: UHERO)

Where the Jobs Are versus Where the Workforce Lives

In studying jobs and incomes, it is important to note where people live on this largely rural island and the significant challenges, time, and cost of commuting. The County has a stated

sustainability objective to improve roadway connectivity to increase efficiency, walkability, and alternative routes for emergency access. In a recent study commissioned by the County of Hawai‘i, *The Fiscal Impact of Development Patterns* by Smart Growth America, documentation and maps provided evidence of the challenges of growth in some areas versus where residents live.

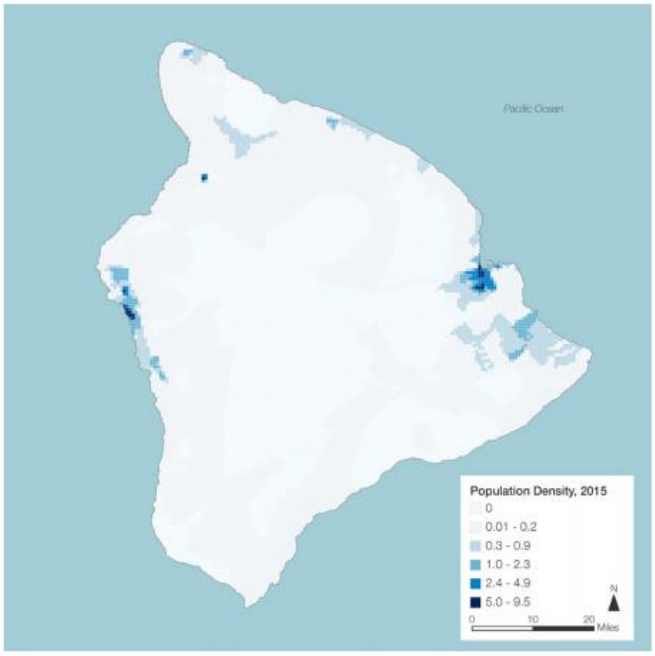
Interviews conducted in connection with this baseline also indicated that there is a shortage of affordable housing located where the jobs are and public transportation to get people to work. Some of the largest employers are located on the west side of the island and prompt significant commutes for employees, such as those from the Hilo and Puna districts who travel as many as two hours each way.

The following excerpt from the County's draft General Plan explains further:

> Data varies, but in general, about one-third of jobs are in Hilo, another quarter in North Kona, 5 to 10% in the Waikoloa area, 5% in Waimea, and about 1 to 7% in each of the other population centers. It is useful to compare these job centers with the County's population centers. Hilo and the Waikoloa area have a surplus of jobs relative to their population, reflecting the fact that residents commute there from other communities. At the other end of the spectrum, the Hawaiian Paradise Park-Orchidland area has a working population that far exceeds the number of nearby jobs. These mismatches are reflected in the increase in the Census measure of "mean travel time to work" from 24.5 minutes in 2000 to 27.1 in 2013. The national average is 25.5 minutes, and the Hawai‘i average is 26.0 minutes.

While the County is engaged in ongoing efforts to identify and enhance community centers with mixed use development – which would also create the opportunity for more efficient infrastructure for businesses and the workforce – to date these efforts have been met with limited interest from residents and businesses. The following maps created by Smart Growth America and the U.S. Census Bureau demonstrate the current impacts and challenges. Additionally, while the island has a substantial base of land and natural resources, much of this is protected or reserved for agriculture and conservation, and hence not available for housing or commercial development.

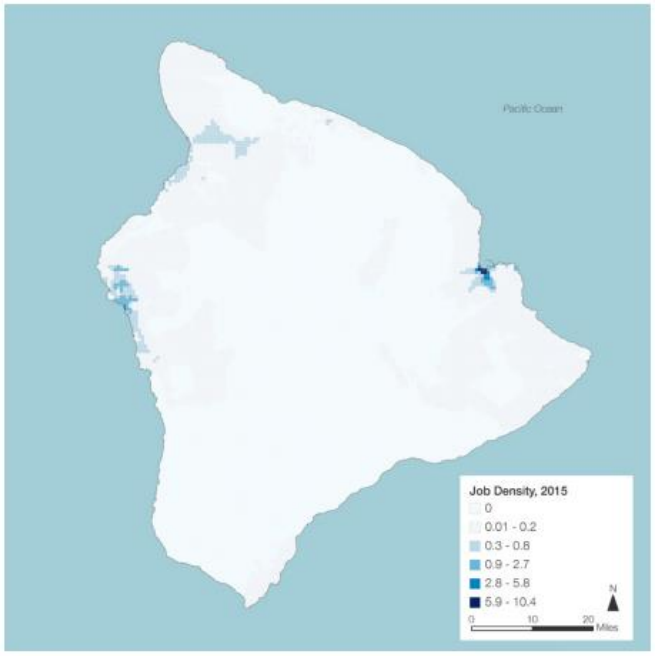
Hawai'i County Population Density, 2015



Source: Smart Growth America, 2019

Figure 8: Map of Population Density

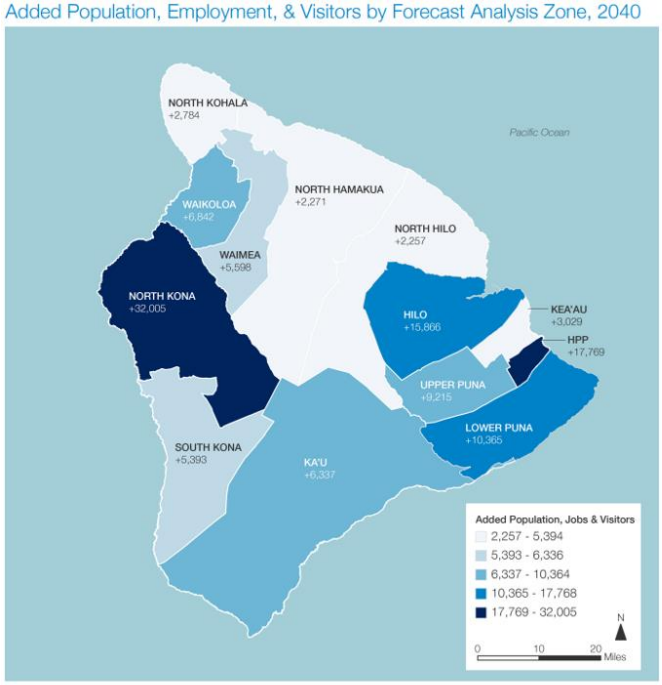
Hawai'i County Job Density, 2015



Source: Smart Growth America, 2019

Figure 9: Map of Job Density

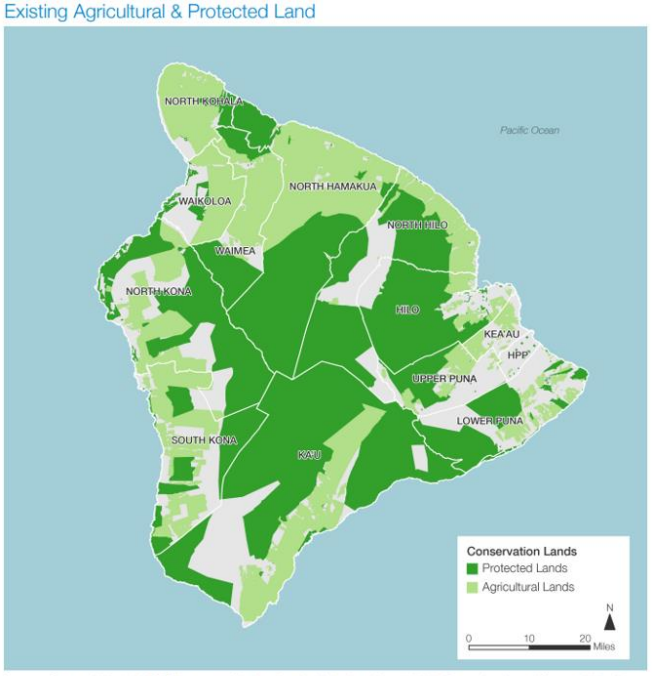
Added Population, Employment, & Visitors by Forecast Analysis Zone, 2040



Source: Smart Growth America, 2019; SMS, *General Plan Comprehensive Review Trends & Forecasts Final Report*, September 2016

Figure 10: Forecasted Population Growth

Existing Agricultural & Protected Land



Sources: County of Hawai'i LUPAG, Important Agricultural Lands; University of Hawai'i - Hilo, Pasture Lands; and County of Hawai'i, Zoning; Smart Growth America, 2019.

Figure 11: Existing Agriculture and Restricted Lands

Reconstruction and Repair Trends

Employment in the Island of Hawai'i construction sector provides one measure of activity through which the impacts of catastrophic events can be measured. In September 1992, Hurricane Iniki traveled east-to-west below South Point of Hawai'i and turned north to track just west of the Hawaiian Island chain to hit the Island of Kauai. Even residual hurricane damage from the near misses on the other islands yielded impulses of reconstruction activity from clearing debris to replacing structures and infrastructure.

This impulse of reconstruction post-Hurricane Iniki was mirrored in a temporary surge in Island of Hawai'i construction jobs. This temporary rise eventually gave way to the ongoing unwinding of the previous construction and investment cycle, the so-called Japan Bubble of the late-1980s and early-1990s. By contrast the 2018, Kīlauea's Lower East Rift Zone eruption destroyed hundreds of homes and wiped out roads and utilities but was subsequently associated with virtually no change in payroll employment in construction.

Neither immediately in the aftermath of the volcanic eruption in May 2018, nor after its conclusion in August 2018, did seasonally adjusted monthly construction jobs from the period exhibit any sign of a construction surge. Kīlauea's 2018 eruption impacts for reconstruction appear now more likely to be medium- to long-term in nature. Households settle on other areas to rebuild, and public infrastructure investment decisions are coordinated with planning efforts to limit future loses or to direct redevelopment elsewhere on the island.

The County's Business Profile

As is the case for many other communities, the largest single employer in the County of Hawai'i is the government, which includes county, state, and federal employees. The second largest employment category is retail establishments, followed by health care and social assistance.

The three primary economic sectors of the Island of Hawai'i economy are the service sector, the goods producing sector (construction and manufacturing), and agriculture. The service sector (education, health, accommodation, entertainment, food, professional, financial, real estate, public, etc.) is by far the largest, representing over 80% of employment. The agriculture sector represents about 6% of employment.

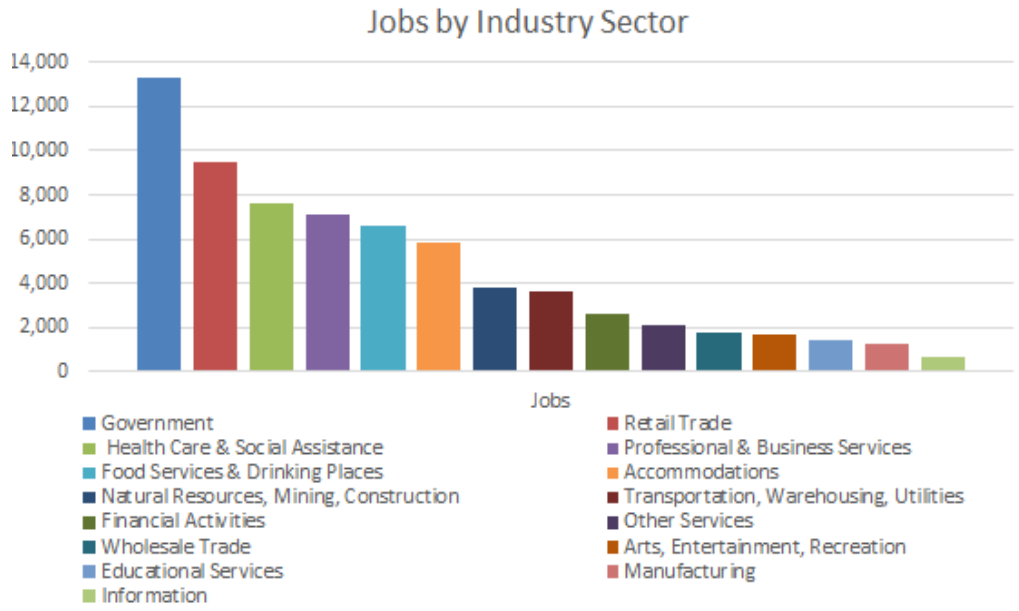


Figure 12: 2019 Hawai'i County Industry Classifications by Number of Employees (Source: data by Hawai'i DBEDT, graph by Institute for Sustainable Development and TZ Economics)

More than two-thirds of workers are employed in one of five key industries: educational service, healthcare, and social assistance (~19%); arts, entertainment, recreation, accommodation, and food services (~18%); retail trade (~13%); professional, scientific, management, administrative, and waste management (~10%); and construction (~9%). Tourism is a significant export which drives the arts, entertainment, recreation, accommodation, and food services industries and much of the retail trade. It represents at least 25% of total direct employment. It also contributes significant multiplier effects which bring essential revenue to many other sectors that also support the resident community, including transportation, warehousing, utilities, finance, professional and business services, health care and manufacturing.

Figure 13 below shows the net change in jobs by industry from Q1 2018 to Q1 2019 in the County of Hawai'i using data from DBEDT. The largest losses were in accommodations and food service and drinking places, mirroring the decline in tourism. The only category of growth was in wholesale, which may have benefited from some "repair and replace" purchases following the disasters. This growth may also be partially associated with hotel renovations and improvements, which were investments on the west side of the island. One resort closed completely for renovations, utilizing the slowdown period in tourism to further existing improvement plans.

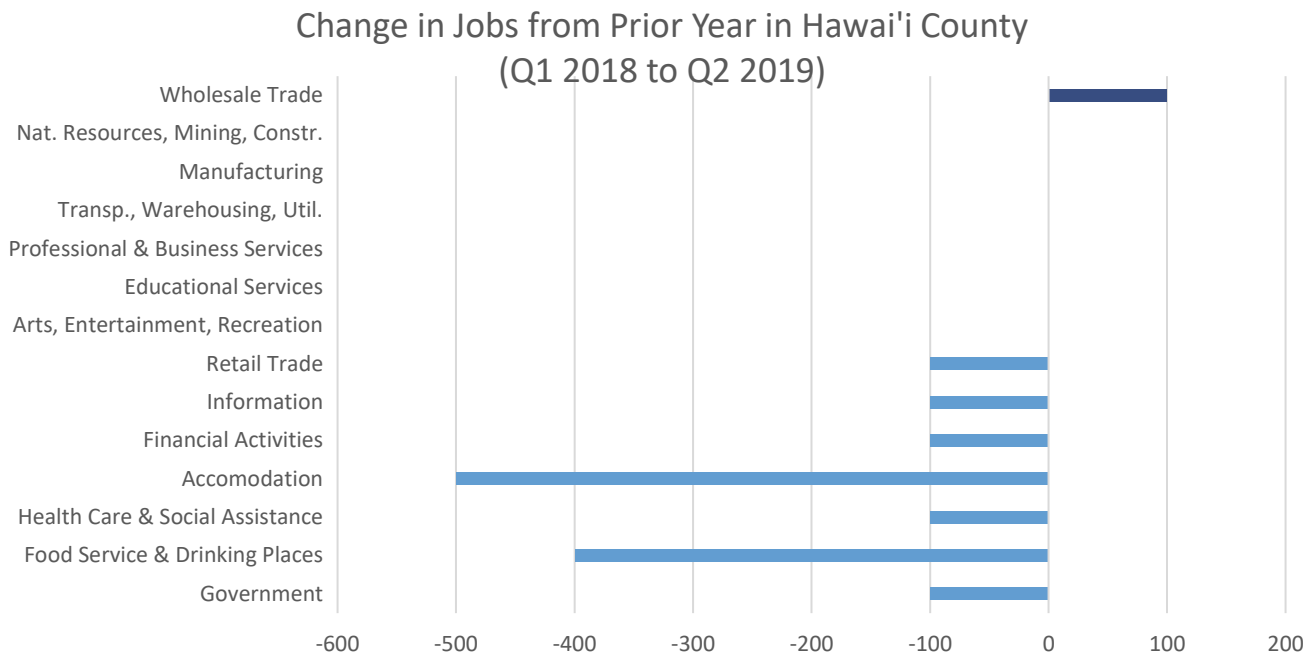


Figure 13: Changes in Jobs 2018-2019 (for those industries that had no noticeable change, there is no indication on the graph) (Source: data by Hawai'i DBEDT, graph by Institute for Sustainable Development and TZ Economics)

Industry Sector Impacts on Job Creation

The table below demonstrates which industries have the largest impacts on other jobs. For the Island of Hawai'i, the largest potential impact comes from 1) Agriculture, 2) Arts, Entertainment, Recreation, 3) Educational Services, and 4) Business Services. For a list of top employers for the Island of Hawai'i, please see Appendix A.

Industry	Inter-county final demand multipliers (Hawaii County only)					
	Output		Earnings		Jobs (2019)	
	type 1	type 2	type 1	type 2	type 1	type 2
Agriculture	1.79	2.39	0.49	0.64	25.9	28.1
Construction	1.42	2.05	0.51	0.67	7.7	10.0
Food processing	1.90	2.40	0.41	0.53	12.3	14.1
Other manufacturing	1.53	1.88	0.28	0.37	6.9	8.0
Transportation	1.52	1.99	0.38	0.51	7.7	9.5
Information	1.50	1.88	0.30	0.40	6.3	7.6
Utilities	1.59	1.85	0.21	0.27	1.7	2.5
Wholesale trade	1.45	1.90	0.37	0.49	7.2	8.7
Retail trade	1.33	1.80	0.38	0.50	10.5	12.2
Finance and insurance	1.41	1.89	0.38	0.51	10.9	12.7
Real estate and rentals	1.06	1.22	0.13	0.17	4.2	5.0
Professional services	1.77	2.37	0.49	0.64	10.3	12.3
Business services	1.53	2.25	0.59	0.77	16.6	19.2
Educational services	1.37	2.10	0.59	0.77	16.9	19.7
Health services	1.59	2.24	0.52	0.69	10.2	12.7
Arts, entertainment, and recreation	1.14	1.78	0.51	0.67	19.5	22.4
Accommodation	1.57	2.13	0.45	0.59	7.8	9.7
Eating and drinking places	1.57	2.15	0.47	0.61	15.2	17.4
Other services	1.54	2.31	0.62	0.81	15.5	18.4
Government	1.32	2.06	0.60	0.79	9.3	12.1

Figure 14: Industry Multipliers (Source: DBEDT)

Location Quotients and Clusters

Location quotients (LQ) are a statistical way of quantifying how concentrated an industry, cluster, or occupation is in a certain location as compared to the nation. A LQ score of "1" means that the size of the industry is proportionate for the size of the resident population. When it is much greater than 1, this is typically an indication of either excess capacity or a valuable export that supports the community's economy.

The tourism cluster in the Island of Hawai'i employs the largest number of people, according to UHERO in a 2017 report, *A New Perspective on Hawai'i's Economy: Understanding the Role of Clusters*. The dominance of Hospitality and Tourism had a location quotient (LQ) of almost 7, which indicates a strong export. Fishing and Fishing Products is another strong cluster with LQ score of 5.7, but with small number of employees. Similarly, Agriculture Inputs and Services cluster has a high LQ score greater than 2, but it is not considered a strong traded cluster because of its relatively small size in relation to total employment. The remaining strong traded clusters are Music and Sound Recording and Water Transportation.

The following graphs from the U.S. Cluster Mapping Tool demonstrate the presence and strength of clusters that drive the economy on the Island of Hawai'i and how these compare to national averages for communities of the same size.

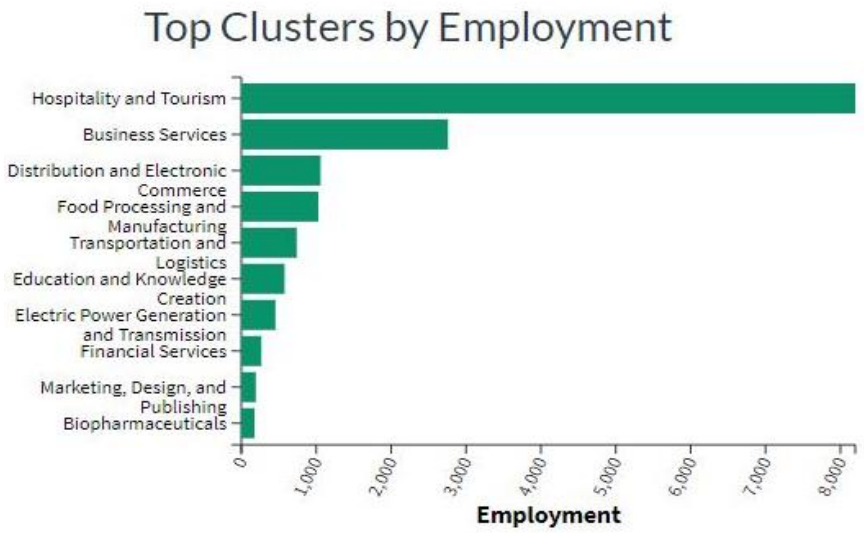


Figure 15: Top Clusters by Employment (Source: U.S. Cluster Mapping tool, http://clustermapping.us/, Institute for Strategy and Competitiveness, Harvard Business School. Copyright © 2014 President and Fellows of Harvard College)

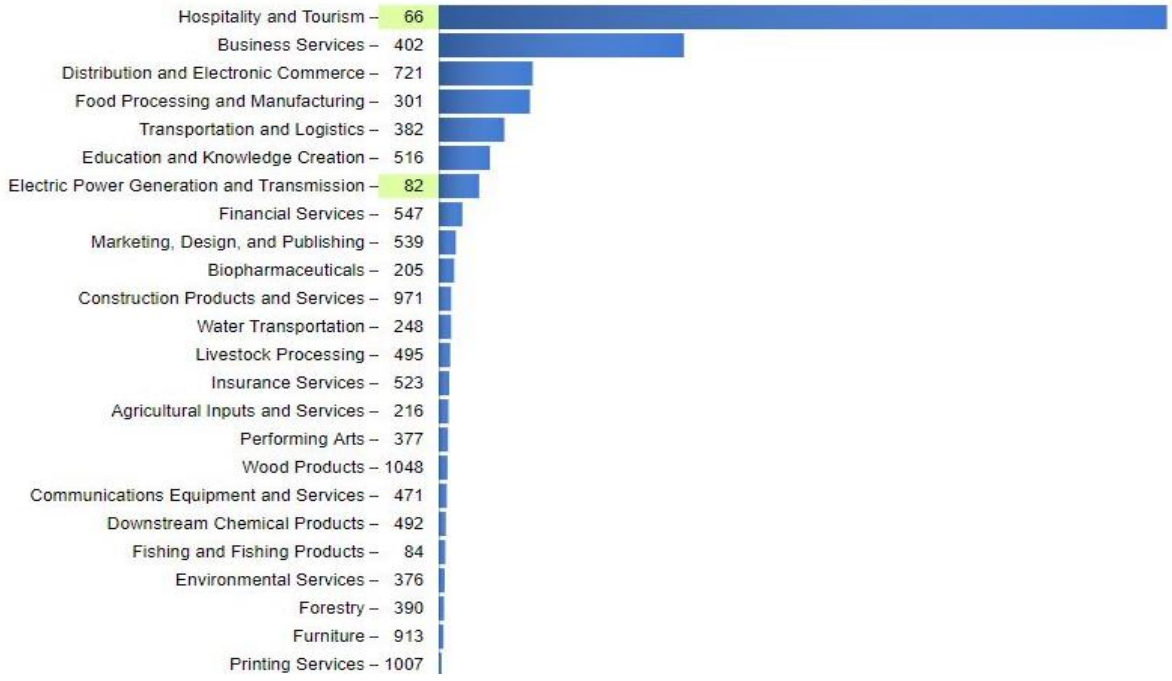


Figure 16: Employment by Traded Cluster (2016) for Private, Non-Agricultural Employment (Source: U.S. Cluster Mapping tool, http://clustermapping.us/, Institute for Strategy and Competitiveness, Harvard Business School. Copyright © 2014 President and Fellows of Harvard College)

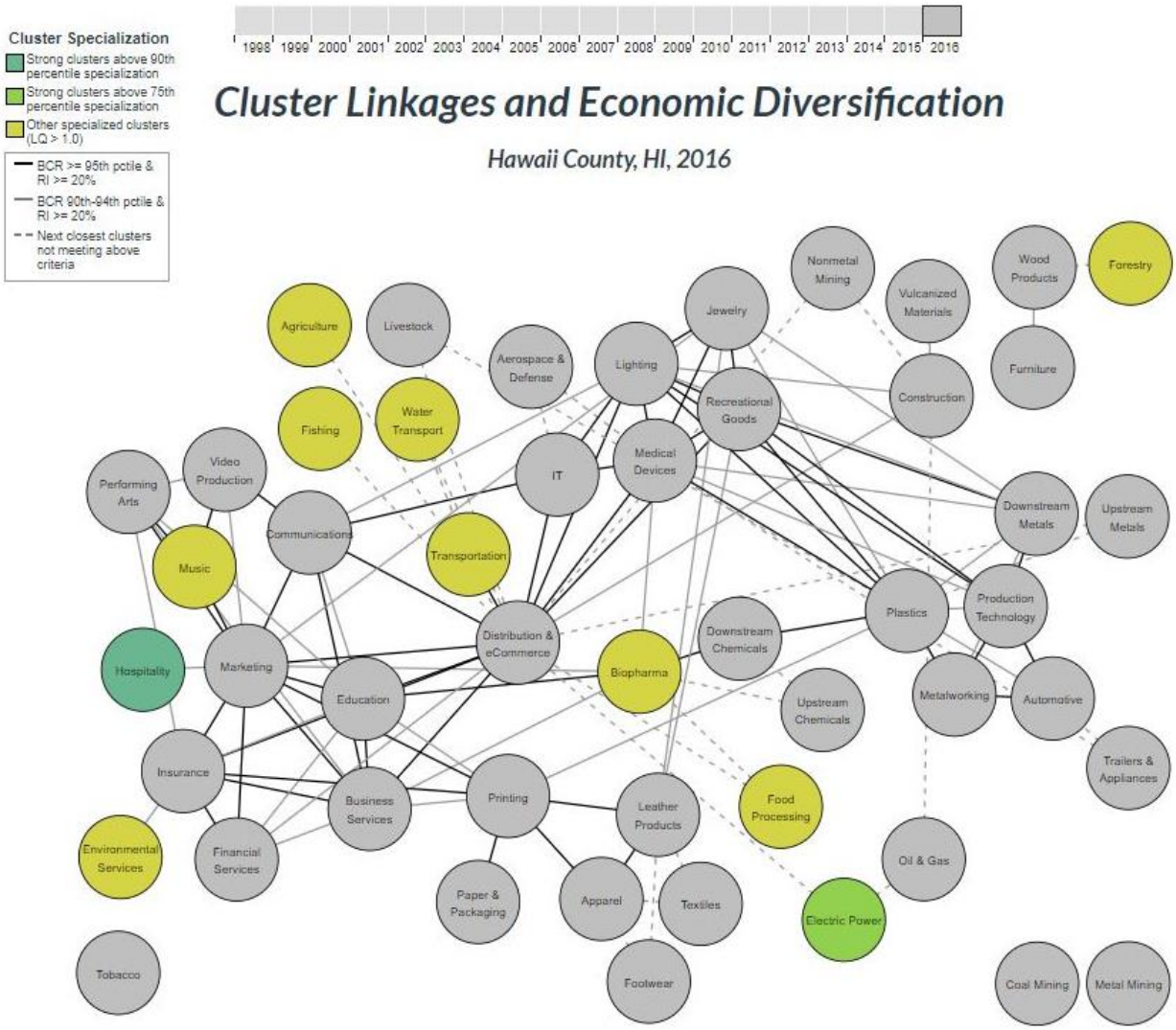


Figure 17: Cluster Linkages and Economic Diversification (Source: U.S. Cluster Mapping tool, http://clustermapping.us/, Institute for Strategy and Competitiveness, Harvard Business School. Copyright © 2014 President and Fellows of Harvard College)

Diversifying the Economy and Emerging Industry Trends

Because of its beautiful nature and abundant natural attractions, Hawai‘i has historically been one of the highest performing locations in the nation – if not the world – for tourism. However, economic diversification has and will continue to be a goal because overdependence on tourism has its detrimental effects on the natural environment, creates overcrowding and increased demand on public infrastructure. Additionally, disasters have brought to awareness that visitors will cancel plans and consider other destinations.

In a discussion of growth and decline of other industries which reveals potential for the future economy of the island, it is useful to refer to an analysis done by the state’s DBEDT on growing and declining industries. The publication, *Hawai‘i’s Targeted & Emerging Industries 2018 Update*

Report, also provided suggested target industries. Business activities were rated on the basis of state and national performance which were more concentrated in Hawai'i's economy. Industries which had developed a competitive national advantage (also referenced as "Base-growth activities") were exporting some proportion of industry output. "Emerging activities" rated high on performance but had not reached a level of concentration that would suggest a competitive advantage. "Transitioning activities" were showing growth in jobs over the measurement period but were outperformed by the same activity nationally. "Declining activities" lost jobs over the measurement period and in most cases (but not all) were less competitive than their national counterpart.

The DBEDT study documented activities which were high performing, with positive job growth combined with a job growth rate that was higher than the nation. These included Cultural Activities, Film, TV, Video Production/Distribution, Specialty Health Care Services, Marketing, Photography & Related, Alternative Power Generation, Specialty Education, Engineering and Related Services, Hospitals & Nursing Facilities, Agriculture Support Services, and Agricultural Inputs.

Over the past decade, the County of Hawai'i's performance was documented, showing where growth and decline occurred prior to the disasters of 2018. The table below details base growth and emerging activities with good potential for growth by industry group.

Industry Groups	Jobs in Hawaii County		Avg. Ann. Job Growth (2008-2018)		Concentration of Industry in Hawaii County		Avg Annual Earnings (2018)	
	2018	Chg 2008-2018	Hawaii	U.S.	2018	Chg 2008-2018	Hawaii	U.S.
Base-Growth Activities								
Music	230	74	3.90%	2.70%	192%	26%	$23,837	$40,066
Cultural Activities	205	103	7.20%	2.70%	174%	64%	$51,573	$55,176
R&D Services	388	24	0.60%	0.30%	139%	9%	$101,369	$124,749
Design Services	363	78	2.50%	1.00%	128%	20%	$25,171	$39,384
Specialty Education	988	486	7.00%	4.50%	113%	26%	$23,627	$23,568
Pharmacies	440	66	1.60%	-0.20%	110%	21%	$43,033	$49,548
Architecture	196	15	0.80%	-0.60%	104%	16%	$52,419	$73,407
Specialty Health Care Services	1600	783	7.00%	4.60%	101%	22%	$49,822	$46,357
Emerging Activities								
Agriculture Inputs	137	26	2.20%	0.60%	98%	17%	$35,799	$71,521
Marketing, Photography, & Related	1520	302	2.20%	2.10%	92%	4%	$22,469	$48,473
Apparel	67	25	4.70%	-3.00%	82%	45%	$77,394	$45,089
Engineering and Research & Development	620	49	0.80%	0.20%	71%	6%	$95,939	$110,105
Radio and Television Broadcasting	85	6	0.70%	-0.60%	60%	9%	$36,894	$86,917
Information and Telecom Tech.	548	82	1.60%	1.00%	50%	4%	$68,250	$130,949
Engineering and Related Services	439	38	0.90%	0.10%	50%	5%	$70,335	$95,130
Film, TV, Video Production/Distribution	100	37	4.80%	0.50%	44%	16%	$36,520	$100,078
Hospitals and Nursing Facilities	1316	221	1.90%	0.70%	36%	5%	$58,799	$68,459
Agriculture Packaging and Warehousing	33	30	25.30%	0.70%	33%	29%	$44,295	$56,800
Computer Services and Software Publishers	391	127	4.00%	3.30%	26%	3%	$52,531	$123,116
Biotechnology	21	11	7.90%	2.70%	19%	8%	$31,436	$186,702
Higher Education	93	42	6.30%	1.70%	8%	3%	$30,020	$56,670
Technology Equipment Distribution	18	7	5.20%	-0.20%	6%	3%	$23,565	$123,600

Figure 18: Targeted Industry Performance for the Hawai'i Island (Source: DBEDT)

Business Sentiment

The County conducted a Business Impact Survey, prepared by ISD, from July through August 2019, to capture more impacts and opinions directly from businesses. The voluntary survey was placed online and extensively publicized. Hard copies were also made available. The business survey had 203 responses from diverse industries. The majority of responses were from the eruption impact area, but there were also responses from around the island and from industry associations which represented businesses island-wide. The purpose of the survey was to give

businesses the opportunity to share their impacts and views on economic recovery related to the Kīlauea Lower East Rift Zone Eruption and Hurricane Lane.

The businesses underscored the island's economic dependence on tourism. Therefore, businesses wanted help restoring tourism as quickly as possible, but they also recognized that there should be limits to visitor numbers to help protect the environment, local culture and limit unintended impacts. Those who talked about the need for tourism attractions were passionate about fully restoring and opening Hawai'i Volcanoes National Park as quickly as possible. In addition to the lava inundation area, the town of Volcano was cited as a business location that has not fully recovered. Many comments noted the need for the island to restore a sense of business-friendliness and reduction in costs of doing business, which included government efficiency. Below are graphs detailing some of the survey results.

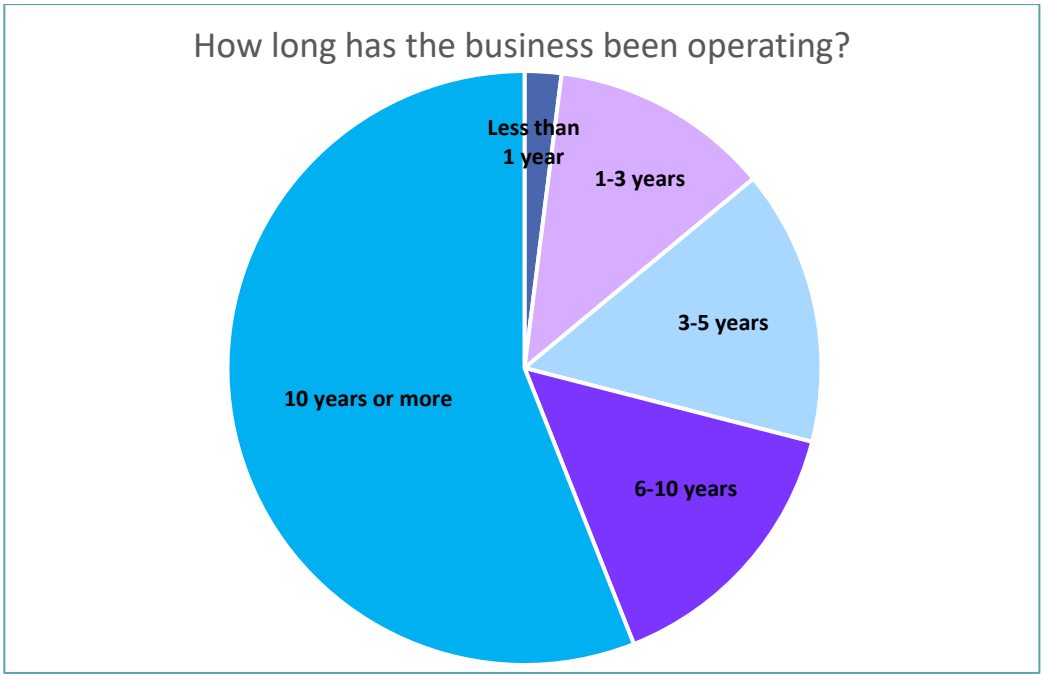


Figure 19: Length of Business Operation; 54% of businesses surveyed are long-standing

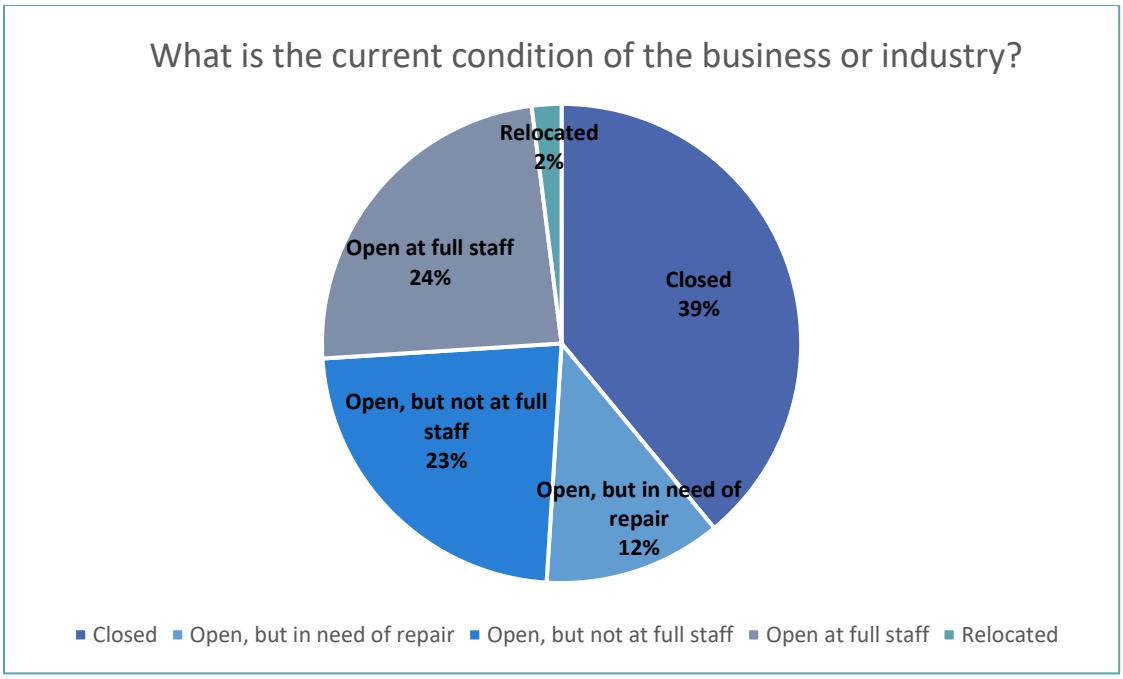


Figure 20: Current Conditions of Businesses Surveyed; over one third of businesses closed

When posed with the question of the impacts to business/industry revenue compared to the prior year, approximately 75% of respondents identified that business revenue had decreased. Of the remaining 25%, about half identified that revenue had remained the same while the other half identified that revenue had increased.

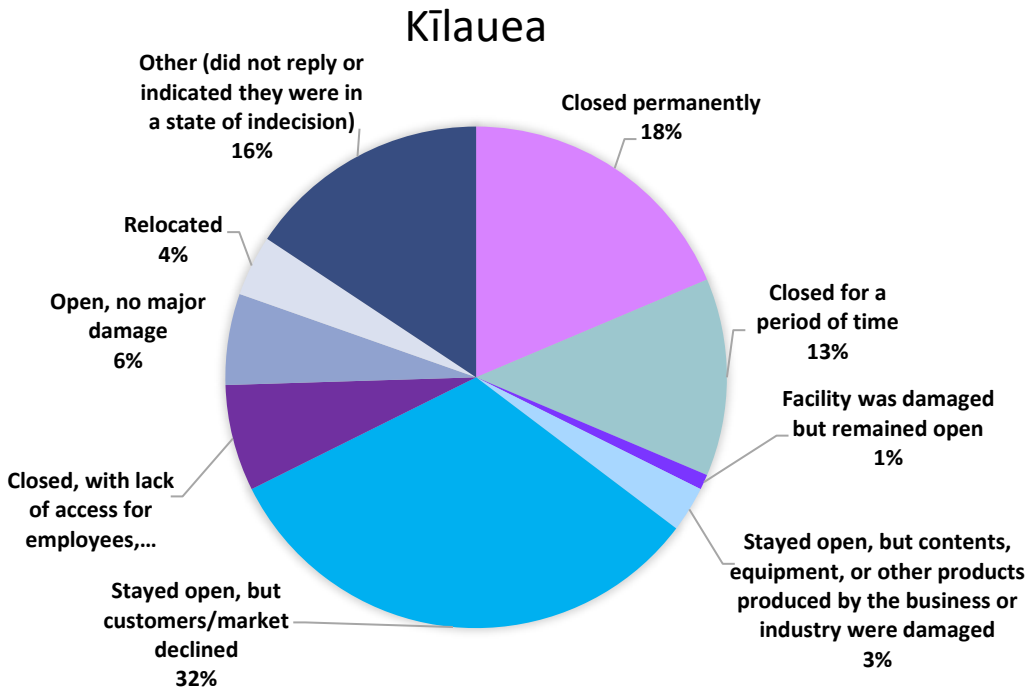


Figure 21: Impacts on businesses from eruption and hurricane; nearly one-fifth of businesses closed permanently

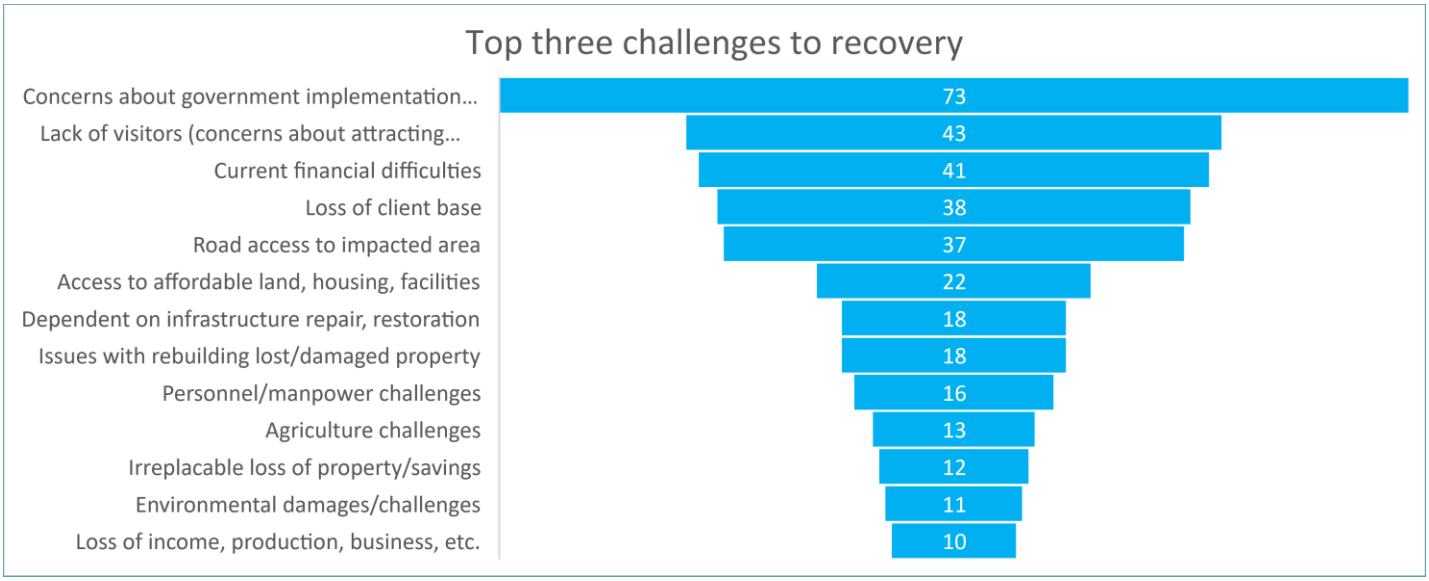


Figure 22: Top responses to most pressing challenges businesses are facing

Results from the survey identified a change in the number of employees/owners/sole proprietors following the eruption and hurricane. Approximately 1,300 employees were reported prior to the disasters while that number decreased to approximately 900 after the disasters. Furthermore, the survey inquired what caused the change in employees for these businesses. The results included 53% of respondents identifying the changes were due to loss of revenue stream, 24% identified employees left the region or island, 13% identified the change was due to loss of workforce housing, while the remaining 10% identified the change being due to loss of transportation.

Select Industry Analysis

Building on the findings about the macro-economic climate and business profile, there are several key sectors that require more in-depth analysis. These include:

- Tourism
- Agriculture and Aquaculture
- Health Care
- Aerospace and Astronomy

Tourism

The tourism sector represents the largest source of base income to support the Hawai‘i Island economy, contributing revenues not only to what people think of as traditional tourism

businesses – i.e. hotels, tours, attractions and retail – but also to as many as 20 other industries. When tourism is up, it creates a surge of positive impact; when it is down, it has an impact on many different types of businesses.

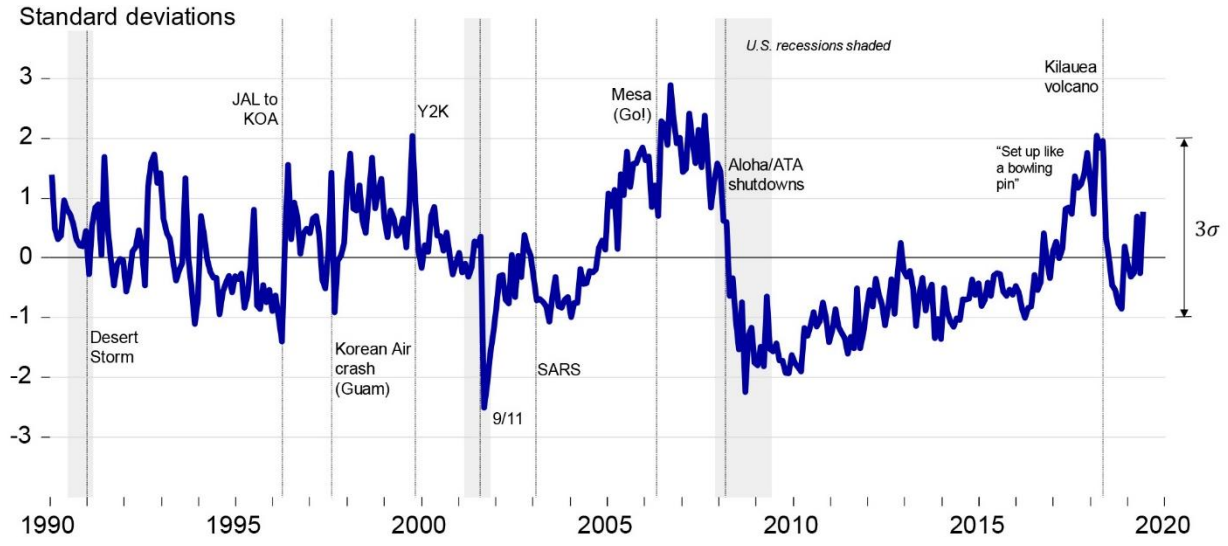


Figure 23: Timeline of Shocks; based on monthly underlying visitor arrivals data through June 2019 (Sources: Hawai'i Tourism Authority, Hawai'i DBETD, seasonal adjustment and standard deviation calculations by Institute for Sustainable Development and TZ Economics)

The effects of Kīlauea's Lower East Rift Zone eruption were on a par with the worst disruptions the island faced over the last 30 years: de-trended, seasonally-adjusted Island of Hawai'i arrivals experienced three standard deviation shocks from 9/11, the Aloha/ATA shutdowns, and Kīlauea's Lower East Rift Zone eruption.

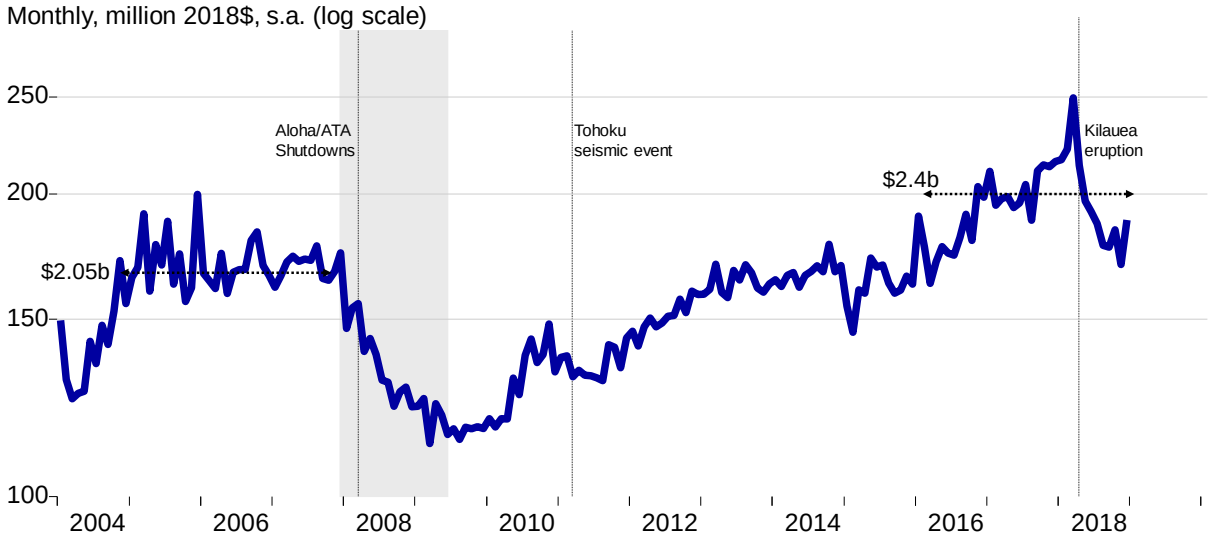


Figure 24: Hawai'i Island Real Tourism Export Receipts; real visitor expenditure through December 2018 (Sources: Hawai'i Tourism Authority, Hawai'i DBETD, U.S. Bureau of Labor Statistics)

The Island of Hawai'i's real tourism export receipts breached the $2.4 billion annual rate at the end of 2016, $2.39 billion in 2017, and $2.40 billion in the first half of 2018. The eruption took island tourism back to 2015 levels, and the total losses against trend since April 2018 are estimated to have been at least $415 million.

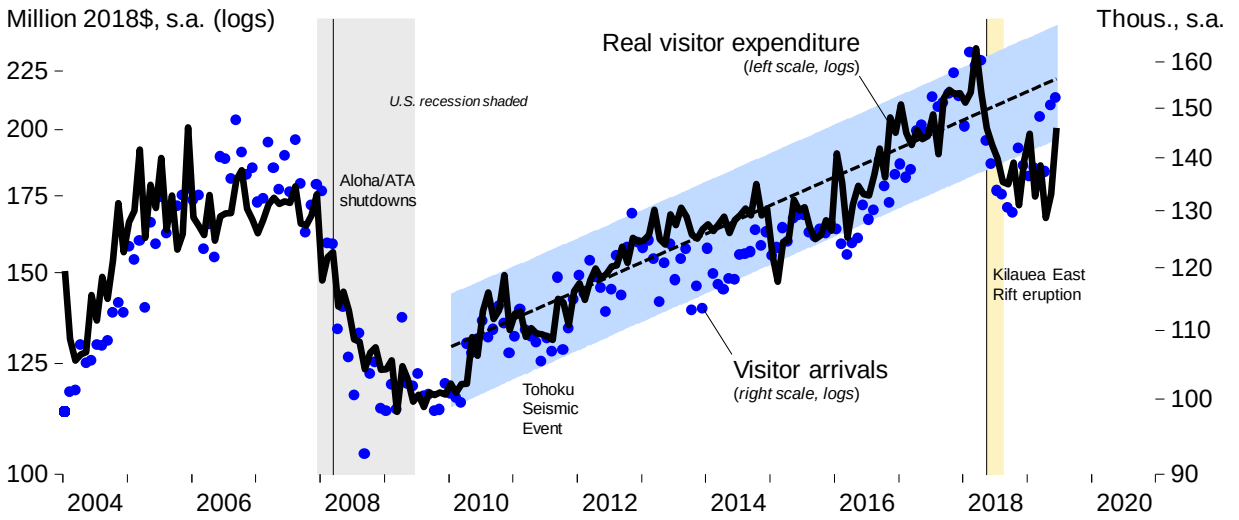


Figure 25: Trend v. Actual Expenditures and Arrivals; real visitor expenditure and visitor arrivals moved in tandem during the 2010s recovery/expansion, collapsed after the 2018 eruption; up to $500 million forgone (Sources: Hawai'i Tourism Authority, Hawai'i DBEDT, U.S. BLS, retrieved from Federal Reserve Bank of St. Louis)

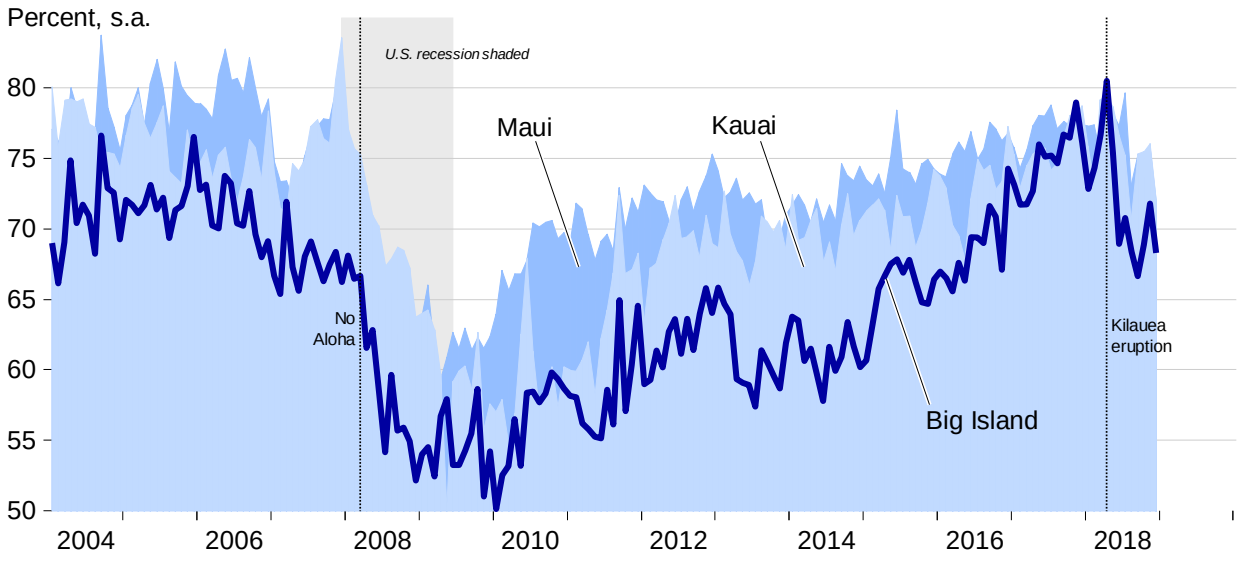


Figure 26: Comparative Island Occupancy Rates (Sources: Hospitality Advisors LLC, Hawai'i DBEDT, Hawai'i Tourism Authority, seasonal adjustment by Institute for Sustainable Development and TZ Economics)

Monthly Neighbor Island hotel occupancy rates, seasonally adjusted, were converging on 80% in early-2018, only to be disrupted by the 2018 eruption.

- Cumulative foregone tourism receipts in the County of Hawai'i were $415 million from May 2018 – June 2019 against a projection based on the pre-eruption trend. Based on DBEDT calculations, for each $415 million reduction in (constant-dollar) visitor expenditure for the Island of Hawai'i there would be a $751 million reduction in statewide output in Hawai'i. This dollar figure excludes approximately $100 million in additional impacts to Maui caused by reduced tourism caused by the volcano.

- To support these findings, consider the following data points for Island of Hawai'i monthly tourism data:
  - May 2018 – April 2019 visitor spending in the County of Hawai'i showed a 12.3% decrease from the corresponding 12 months: May 2017-April 2018.
  - May 2018 – April 2019 visitor arrivals in the County of Hawai'i showed a 10.1% decrease from May 2017 – April 2018 and a 20.0% decrease based on the pre-eruption trend.
  - County of Hawai'i total visitor expenditure declined 11.5% in the first half 2019, compared to first half 2018, and average daily expenditure declined 6.8% between the first half 2018 and first half 2019.
  - Total visitor days also declined 5.9% between first half 2018 and 2019 and declined 7.3% between May 2017 – April 2018 and May 2018 – April 2019.

According to the 2018 Visitor Plant Inventory prepared by the Hawai'i Tourism Authority, the Island of Hawai'i's overnight accommodations stood at 11,284 in 2017 and dropped to 10,811 in 2018. This included 6,110 hotel rooms with 29.7% in the luxury category. The reduction in overnight accommodations occurred due to the closure of the 142-room hotel Uncle Billy's Hilo/Pagoda Hilo Bay in July of 2018 due to the facilities aging out and one resort on the west side of the island closed temporarily for pre-planned renovations. A significant, but unknown, number of vacation rentals were removed permanently from inventory in the Puna district due to lava inundation. Other vacation rentals were temporarily closed when air quality declined and earthquakes increased.

Another significant factor in the decline in visitor arrivals and expenditures has been the reduction in air seat capacity to Hilo. Due to many group travel cancellations and an overall reduction in demand to the east side of the island, one national airline dropped its schedule from seven weekly flights to four in Fall 2018. This loss of air service into Hilo means that it is far less convenient for visitors; additionally, the cost of the service to Hilo is higher than to Kona. A significant amount of lost business was redirected to the west side of the island which has seen an increase in service. There is some optimism that a second airline will offer new direct service from the U.S. mainland to Kona and new interisland service to Hilo will compensate for some of these losses.

	KONA			HILO		
	2017	2018	% Change	2017	2018	% Chage
TOTAL	255,813	333,885	30.5	9,472	14,953	57.9
US TOTAL	225,843	282,959	25.3	9,472	14,953	57.9
US WEST	219,364	273,345	24.6	9,472	14,953	57.9
US EAST	6,479	9,614	48.4			
INTERNATIONAL	29,970	50,926	69.9			
JAPAN	11,466	28,474	148.3			
CANADA	18,504	22,452	21.3			

	KONA			HILO		
	2018	2019	% Change	2018	2019	% Change
TOTAL	333,571	344,117	3.2	14,953	9,130	-38.9
US TOTAL	282,645	291,762	3.2	14,953	9,130	-38.9
US WEST	273,031	279,477	2.4	14,953	9,130	-38.9
US EAST	9,614	12,285	27.8			
INTERNATIONAL	50,926	52,355	2.8			
JAPAN	28,474	28,752	1.0			

Figure 27: Loss of Air Seats to Pre-2017 Levels. (Sources: Hawai'i Tourism Authority, Hawai'i DBEDT)

This data leads to several points:

- Tourism's importance to the island's economy cannot be understated, not just in direct benefits but in ancillary jobs and business generated.
- While there are hotels, bed and breakfast inns, and vacation rentals on the east side of the island and within the Puna region, a larger share and wider range of overnight accommodations are available for visitors to the west side of the island.
- The volcanic eruption affected the entire island in terms of business effects but resulted in far less long-term impact for tourism on the west side of the island.
- With the decline in air capacity to Hilo, the east side of the island will continue to be at a structural disadvantage in terms of trying to recoup its lost tourism market unless demand for air-seats can be returned.

Agriculture and Aquaculture

Agriculture's interconnectedness within the fabric of the Island of Hawai'i economy is only tempered by the industry's relatively small size. Food grown on the island is either consumed locally or exported to other islands across the state, where it is processed or consumed – with the notable exception of livestock, macadamia nuts, flowers and nursery products bound for national and international export markets. The U.S. Bureau of Economic Analysis enumerations

of gross product by state identified that agriculture was 0.66% of statewide Hawai'i GDP or value-added in 2018. For the Island of Hawai'i, its share of GDP is approximately 1.94%.

Data from the 2018 State Agriculture Overview show that the total acres available for agriculture on the Island of Hawai'i are 1,100,000. The island produces 48% of the state's agriculture sales, according to the 2017 Census of Agriculture by the U.S. Department of Agriculture. However, only 1% of the land is in farm use as cropland, pastureland, woodland and other related uses. The share of sales by type is crops (59%) and livestock, poultry, and products (41%). There were 4,220 farms as of 2017 with the average size of farms at 157 acres.

The value of production by commodity in 2018 reflected significant losses, particularly in papayas, cut flowers, and other potted plants which were grown in the impacted region. The agricultural industries with the highest self-reported losses were floriculture and nurseries (at $13.3 million) and papayas (at $6.5 million). Additionally, at least 46 farms were directly affected by the eruption. About 25 farms that were destroyed also had loans totaling $2.5 million through the state.

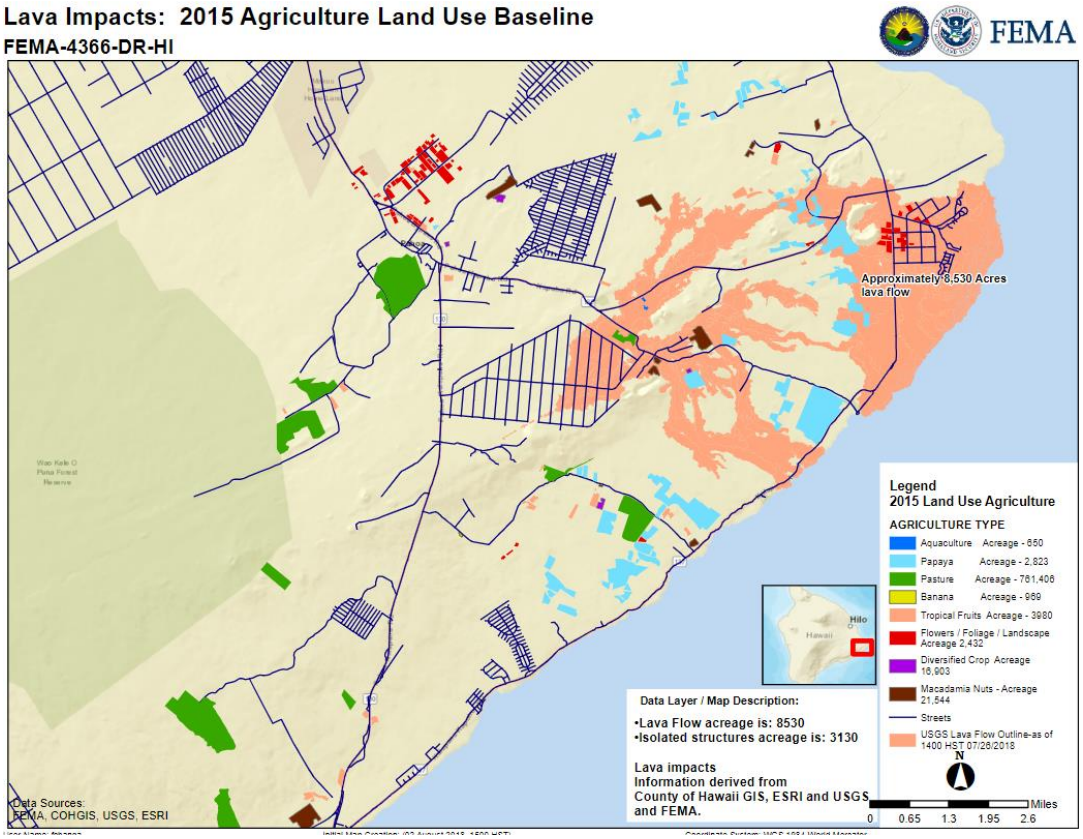


Figure 28: Lava Impacts to Agriculture (Source: FEMA)

According to a survey conducted by the College of Tropical Agriculture at the University of Hawai'i in August 2018, some $27.9 million of direct losses were reported by growers due to lava flows, volcanic emissions, ash and lack of vehicular access. This is partial data based on voluntary survey participation. Many of these businesses are unrecoverable and must find new land to restart operations.

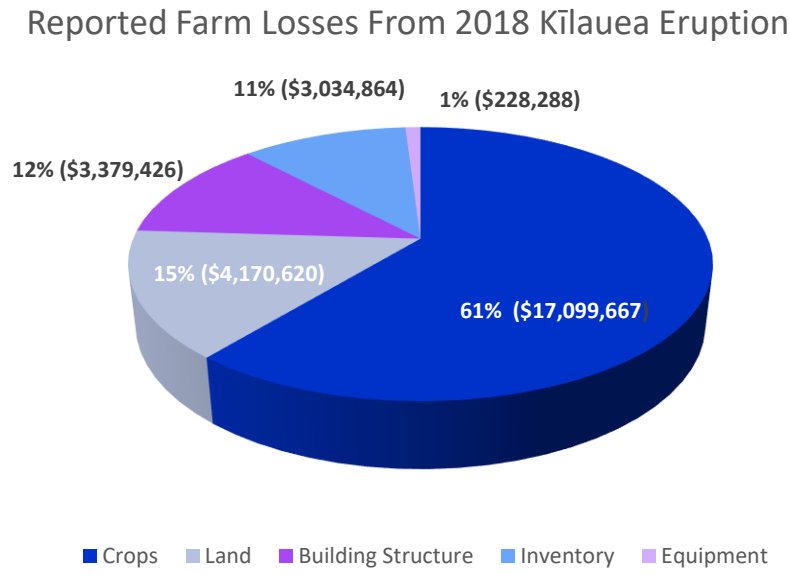


Figure 29: Reported Farm Losses

- The Hawai'i Farm Bureau Federation estimates that 80% of all papaya grown in the state came from the Kapoho area of the Island of Hawai'i, which was heavily affected by the lava flows. Other industry members estimate only 300 acres are currently available for production, until road access and the flow cool sufficiently to replant papaya.

- $13.3 million of the reported losses were from the floriculture industry:
  - 40 acres of floriculture was decimated by the volcanic activity
  - 50% of Hawai'i's cut flower orchid production is gone

Livestock/Ranching

Livestock production has historically been an established industry on the Island of Hawai'i and may hold greater economic opportunity for the future. While 72% of cattle production (as of 2015) was shipped live to the U.S. mainland and Canada, below are factors offering potential for expansion of the local market:

- The average Hawai'i resident consumes 54.1 pounds of beef annually.

- Overall production of local beef in the state is 7.4 million pounds, which represents 5.8% of the beef consumed in Hawaiʻi.

Fishing

Fishing has been an essential element of life on Hawaiʻi for as long as humans have inhabited the islands. As such, fishing for commercial purposes remains a significant sector of the local economy. Fish continues to be a major source of protein for residents as well as a significant export, mainly Bigeye Tuna and Swordfish (DOH & OHSM 2012). However, according to a report published by the Department of Land and Natural Resources for 2018, there was a major decline in the number of landings made between May and November of 2018. In December 2018, though, it can be observed that sea landings do begin to rise again but still below May 2018 levels (DLNR Hawaiʻi 2018).

Given that the Island of Hawaiʻi contributed significantly to the state's fishing industry, and the fact that an important boat landing – the Pohoiki Boat Ramp – was made inoperable by the eruption, the disaster impacted the fishing industry considerably as shown in the following statistics:

Pohoiki Boat Ramp Catch Data	
Data Year	**Commercial Fishing Catch in Pounds**
2016	207,460
2017	221,325
2018 (disrupted mid-year)	66,599

Figure 30: Fishing Catch Data (Source: Hawaiʻi DLNR, Division of Aquatic Resources)

Aquaculture

According to the 2017 annual Hawaiʻi Aquaculture Report from the Hawaiʻi Department of Agriculture, Hawaiʻi statewide aquaculture sales totaled $58.7 million in 2013, $78.2 million in 2014, and $75.7 million in 2016.

- On the Island of Hawaiʻi, significant aquaculture research, development, and production occur at the state-managed Natural Energy Laboratories Hawaiʻi Authority in West Hawaiʻi.

- The demand for seafood is increasing and Hawaiian residents each consume, on average, 37 pounds of seafood annually.

- Foreign imports make up 90% of the seafood Americans consume. This foreign foothold is also evident in Hawaiʻi where the state's aquaculture industry is struggling to grow due

to high operating risks and production costs. Hawai'i shrimp and fish farmers stated in the report that the most significant barrier to their enterprises are the state and federal regulations, which largely does not apply to foreign imports.

- Aquaculture losses due to the 2018 eruption were limited to several farms which were overrun by lava flows. The operations were unique in being located within the footprint of the island's geothermal facility to be able to make use of the spent water resource.

Health Care and Social Assistance

Health care is the fastest growing cluster in the United States in large part because of the innovations in medical technologies and treatments, as well as the fact that people are living longer and eventually need more health care services.

An industry forecast from the Hawai'i Department of Labor and Industrial Relations stated that Healthcare and Social Assistance was expected to dominate job gains with the projected addition of 1,950 positions over a 10-year period. However, since the eruption, approximately 100 jobs were lost in this sector. This can be primarily attributed to the closure of wellness businesses that were located within the lava impact area and other businesses that depend heavily upon the tourism industry throughout the island.

There are several factors which play a key role in the growth and local potential for this industry going forward:

<u>Aging Population</u>

- According to the United States Census Bureau, 17% of Hawai'i residents are 65 and over, totaling nearly 245,000 statewide;

- From 2010 to 2016, the average annual growth rate for the Island of Hawai'i was 5.7%, where nearly 1 in 5 individuals are 65 and older;

- The Island of Hawai'i has the highest median age at 42.2 years, compared to the state median age of 38.6 years;

- According to the Hawai'i Community Foundation, estimates suggest that nearly 40,000 seniors will need long-term care in 2030.

Number of health clinics

- As of 2012 (according to the Bureau of Labor Statistics Quarterly Census of Employment and Wages), the Health Care and Social Assistance Industry contributed approximately 506 establishments, 8,416 employees, and $353,014,000 on the Island of Hawai‘i.

Anecdotal evidence and findings from business surveys suggests that the lack of health care services in the Puna region, compared to the size of the population, indicates that there is a shortage of specialists in the region.

Number of doctors

- Comparing the number of physicians to the average utilization of physicians across the U.S., the Island of Hawai‘i had 41% fewer positions than the island should have. In fact, according to the John Burns School of Medicine at University of Hawai‘i, the island is more than 40% understaffed overall.

- The school’s research also shows that statewide, Hawai‘i is short of 700 doctors.

- According to local physicians and surgeons, the report stated that a key issue with practicing medicine on the Island of Hawai‘i is the low wages and income and the relatively high cost of living.

Aerospace and Astronomy (Includes Technology and Defense)

According to DBEDT data, the technology sector accounted for 28,419 jobs in 2019 statewide. Average earnings in Hawai‘i’s technology sector are relatively high, at $81,849 in 2018, which is 50% higher than the state’s average income. Over a decade from 2008 to 2018, alternative power generation had the strongest job growth among the technology industry groups, although the total jobs were still relatively small at 312 jobs.

Information Technology (IT) plays a major role in the state economy. Estimated annual revenues for companies operating in Hawai‘i that provide tech services impacting aerospace statewide is approximately $285 million.

The lack of connectivity on the island is a challenge for some communities. While according to the website Broadband Now, Hawai‘i ranks as the seventh most connected state in the United States; however some 9,000 residents on the Island of Hawai‘i do not have access to any wired internet, and 22,000 do not have access to 25 megabits per second (Mbps) broadband. In Pāhoa,

only 61% of residents have access to wired providers (BroadbandNow 2019). Growth of the island's economy and the workforce's capacity to expand will mean an exponential demand for connectivity at high speeds. Partners such as the State Department of Education Broadband Hui are working to bring together public and private resources to meet that demand in the short to medium term.

Hawai'i's strategic mid-Pacific location, Moon/Mars-like terrain, and long-standing ties with space-faring nations throughout Asia and the Pacific, afford strategic assets and capabilities that can be leveraged to realize humankind's full potential in space. Major aerospace corporations including Boeing, Lockheed Martin, Northrop Grumman, Raytheon, and BAE Systems, already established in Hawai'i, will have opportunities to expand their operations in the island as a bridge to Asian and Pacific markets.

Aerospace – airlines, helicopter services, research, flight training, and astronomy – can also be an important driver in both creating and sustaining an "innovation economy." It is a growth industry that is not expected to be exported once it matures:

- The global aerospace industry in 2015 was valued at $323 billion;
- The aerospace sector of Hawai'i's economy (statewide) represented 5.5% of State GDP, or approximately $4 billion in 2014;
- The largest segment of Hawai'i's aerospace industry (72%) comes from civil aviation, including flights in and out of Hawai'i, helicopter tours, and ancillary support services (refueling and maintenance);
- The economic impact of the aerospace and defense industry on Hawai'i's economy is significant, with 2,100 workers, $408 million in output, $207 million in value added, and $156 million in labor income;
- There are 12 facilities for astronomy housing 13 research observatories representing 11 nations on Mauna Kea;
- According to UHERO, local astronomy related expenditures in 2012 were $58.43 million on the Island of Hawai'i, $25.80 million on Oahu, and the total astronomy-related spending statewide was $88.09 million;
- Including indirect and induced benefits, the astronomy sector had a total impact of $167.86 million statewide, with the largest impact in the County of Hawai'i of $91.48 million (University of Hawai'i, 2014).

The disasters had an overall limited impact on the aerospace industries with the exception of reduced air travel aligned with visitor arrivals numbers and post-eruption reduction in helicopter tours over impacted area and the Puʻu ʻŌʻō crater.

Infrastructure and Key Assets

Roads, Water and Power Infrastructure

According to the American Society for Civil Engineers (ASCE), the state's infrastructure in general is in dire need of repairs and upgrades. On its 2019 infrastructure report card, Hawaiʻi received a D+ overall in terms of quality of infrastructure. This study examined roads, bridges, harbors, airstrips, and more (ASCE 2019).

The Hawaiʻi Institute for Public Affairs (HIPA) released a report in June 2014 which estimated that the state faces upwards of $15 billion in infrastructure needs through 2034. This includes upkeep, maintenance, and upgrades, which according to ASCE are desperately needed sooner rather than later. The HIPA report concluded that if Hawaiʻi's infrastructure needs are met, it will generate $1.7 billion in tax revenue, and create over 212,000 new jobs across the state (HIPA 2014).

The Hawaiʻi County General Plan includes a proposal for future roads in Puna that includes installation of roundabouts. Doing so is expected to improve safety and ease congestion at intersections, especially for those who live on major roads and make pulling out of their respective driveways easier. Roundabouts also reduce the need for traffic lights, which reduces the community's burden on the island's power grid (County of Hawaiʻi Planning Department 2019).

As discussed earlier in this study, road infrastructure is vital for job commutes and visitor access. Impacts from the disasters included:

- Nearly 13 miles of public roads were inundated by lava, isolating homes, visitor accommodations, and farms.

- Due to volcanic activity, cracks formed on roadways in and around Hawaiʻi Volcanoes National Park, including Highway 11, and on Highway 130 in lower Puna.

- As of October 2020, the County restored lava inundated Highway 132 at a cost of about $5.75 million (covered by a Federal Highways Administration reimbursement) and a temporary road was built over some inundated sections of Highway 137. Repairs also

were done by HDOT on Highway 130 where steel plates were used over ground cracks where substantial heat from the underground magma dike was detected.

- As a result of Hurricane Lane, the State of Hawai'i Department of Transportation (HDOT) reported that the local highway system in and around flooded communities sustained significant stormwater damage from the 50 inches of rain. The Daniel K. Inouye Highway (Highway 200) between mile markers 8 and 11 and Mamalahoa Highway (Highway 11) experienced severe road and drainage system damage due to the high volume of runoff; according to HDOT, many drainage systems required repair.

- Stormwater from Hurricane Lane also caused numerous landslides and embankment failures; surface water flow caused landslides along Hawaii Belt Road (Highway 19) with the most severe landslide requiring construction of a mechanically stabilized wall.

Water

The eruption damaged or destroyed 14.5 miles of waterlines. As of October 2020, the County Department of Water Supply does not have plans to restore water service in the area due to the geological conditions following the eruption and the impacts on the Department's ability to access, store, and convey water where the lava inundated land.

It does not appear that new wells could be established in the eruption area to serve facilities such as Isaac Hale Beach Park due to water quality and intrusion of salt water. A private well south of the rift zone was tested as "junk." As of August 2019, U.S. Geological Survey (USGS) was undertaking a research project on the status of the water table.

Currently, the closest potable water distribution point is at the top of Highway 132, just north of Puna Geothermal Venture's (PGV) entrance. Potable water availability is not a determinant factor for agricultural crops typically proposed in the Kapoho area as most were previously serviced by catchment or rainwater.

Energy

Hawai'i's energy costs are among the highest in the nation and on the Island of Hawai'i costs are 15% to 25% higher, which has significant impacts on the competitiveness of businesses and household expenditures.

Hawai'i imports 100% of its non-renewable transportation and electrical energy. The average Hawai'i County gas price as of 2018 was $3.69 per gallon for regular gas, a 19.32% year-over-year change from 2017 (UHERO). Statewide, regular gas prices in 2018 were $3.65, which

showed a slightly lower yet still significant year over year increase of 17.54%. Statewide, electricity retail prices across all sectors saw a 12.09% year over year increase in 2018, versus Hawai'i Island which had a year-over-year increase of 10.26%.

In 2011, the State set ambitious goals to convert to 100% renewable energy by 2045, and by 2018 that portfolio had advanced from 11% to 27%. Island of Hawai'i energy producers were contributing a significant mix of renewable energy sources in the form of wind, solar/photo-voltaic, hydrogen, and geothermal which alone provided up to 38 megawatts of electricity – accounting for 31% of the island's energy needs. This diversified renewable portfolio includes over 12,000 private rooftop solar installations.

Yet, the adoption of renewables is not without its challenges, including the development and adoption of emerging technologies and the integration of such technologies into the existing island-wide systems. Wind and solar are both examples of renewables which are dependent on atmospheric conditions resulting in inconsistent power delivery required to efficiently manage utility-scale baseload. To off-set such challenges, investments are being pursued in battery technology and hydrogen power.

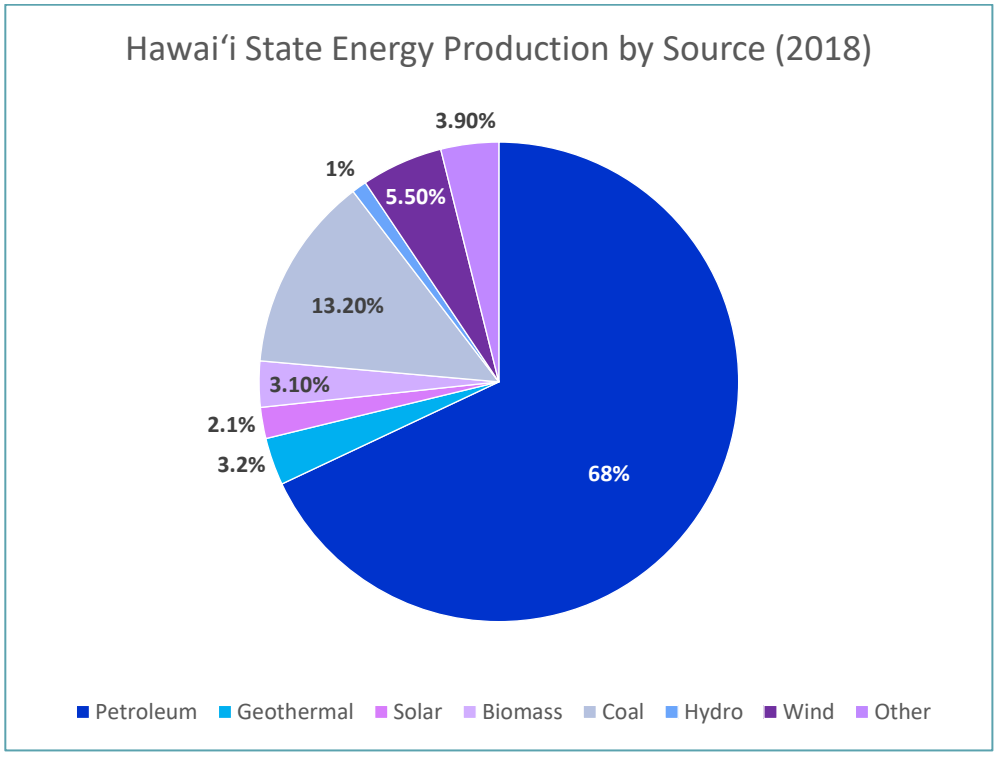


Figure 31: Hawai'i State Energy Production by Source (Source: Hawai'i State Energy Office)

Due to the impacts of the 2018 Kīlauea eruption, geothermal operations were shut down for a two-year period and subsequently required restoration of three inundated wells and production wells that had been plugged as safety precautions, and extensive repairs to infrastructure. The

restoration effort included work with the utility to restore high-voltage transmission lines and the construction of a 'pioneer road' across a still hot lava flow to gain access to the facility and provide adjoining property access for residents and farmers.

The utility suffered lava inundation losses, including a high voltage switching station and 900 electric poles and related distribution lines serving residents, vacation accommodations, farms, and recreational sites.

Advance and prudent planning by the geothermal operator, the utility, and county and state regulators and emergency operations anticipated potential impacts to the operations that are located directly on the Lower East Rift Zone. This allowed for safety measures to be implemented and planned electrical system workarounds. While some residents and farms had power cut off, and the load distribution was altered, electrical service to most of the island's grid went on without disruption. As a result, the direct economic impacts of the disaster related to energy were negligible, except for the directly affected households and the geothermal operator.

The eruption highlighted vulnerabilities in the electrical generating and distribution systems, including safety concerns, the cost of infrastructure, and customer service disruption. Yet, the losses and exposed vulnerabilities did not cause the state to waiver from its renewable energy goals by 2045. In fact, lessons learned from the disaster further emphasized the need to diversify and seek innovation in energy sources, in order to reduce weaknesses and vulnerabilities throughout Hawai'i's energy systems.

Housing and Real Estate

Existing Home Price Dynamics

Any evidence of changes to the Island of Hawai'i's existing home sales price trajectories is either missing from the data sets or is swamped by housing market-wide forces at work. What distinguishes the island's housing valuations, since the housing market recovery began in 2011, was not the restoration of the cycle but the relative tranquility of market conditions. Home price appreciation was initially sharp as the cycle turned in 2011, then gradually slowed down to low single-digit rates of annual price appreciation as shown in a data set comprising existing home sales prices available through February 2018.

Trends in the Island of Hawai'i housing market can be displayed in regional contexts, as shown in the figures below. Single-family existing home sales prices are shown for the Hilo side (comprising Tax Map Keys or TMK 1-4), Kona side (TMK 5-8), and Ka'u (TMK 9). While the data for Ka'u added noise to the other regional aggregations, the Hilo and Kona data shows deceleration of price appreciation during the 2010s.

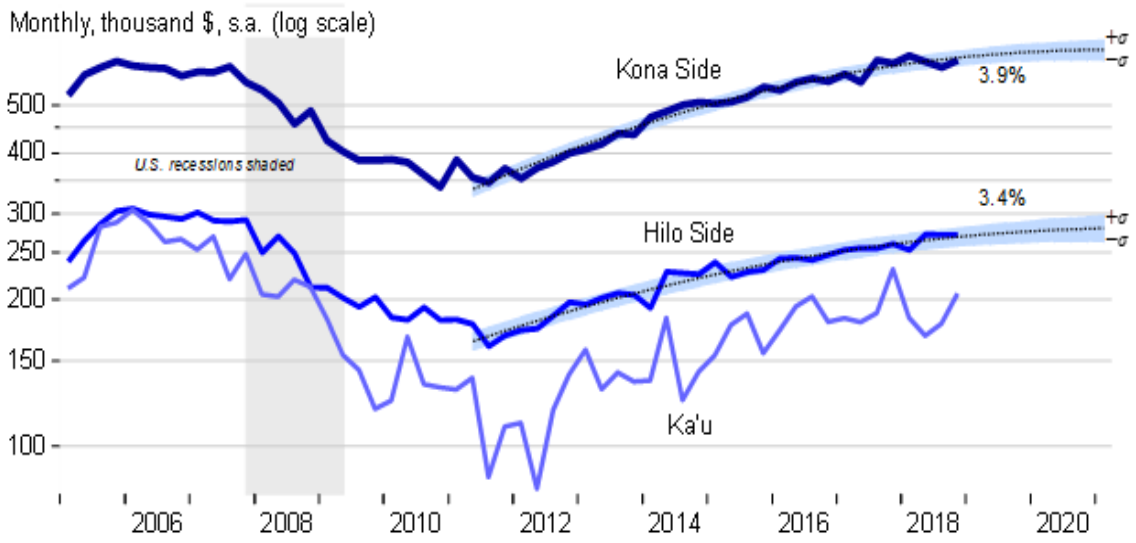


Figure 32: Single-Family Home Median Sales (Source: Hawai‘i Information Service, adjustments by Institute for Sustainable Development and TZ Economics)

Island existing single-family home median sales price appreciation has slowed since turning to recovery in 2011, recently to a 3% to 4% annual rate of increase.

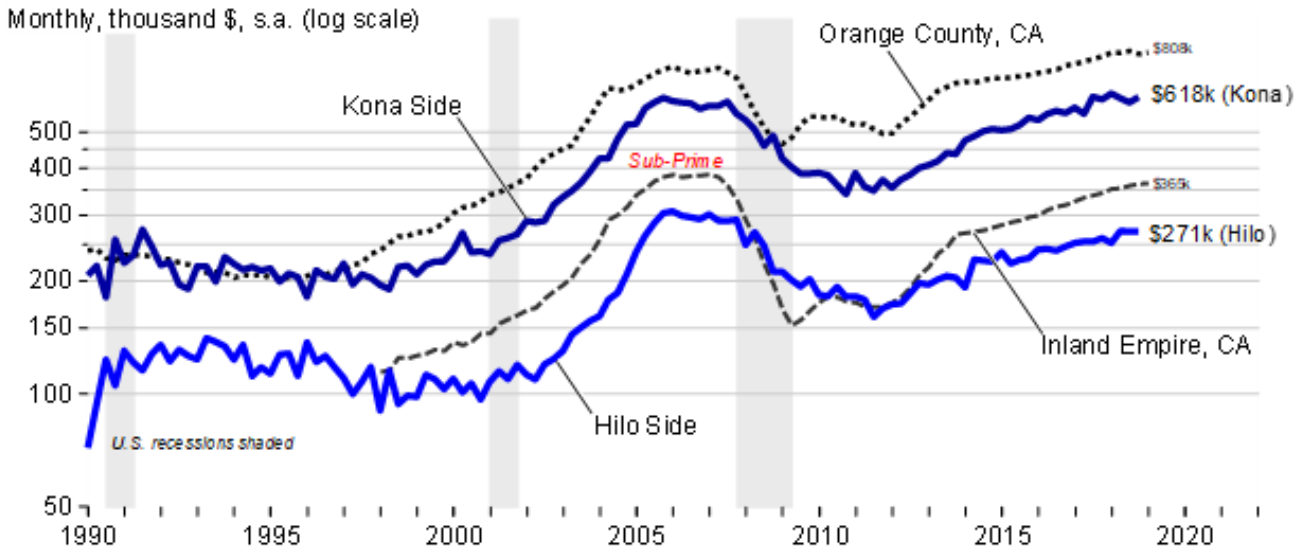


Figure 33: Comparison of Valuations (Sources: Hawai‘i Information Service, California Association of Realtors)

Quarterly median single-family home price comparisons provide a basis for contrasting Island of Hawai‘i valuations with Southern California markets, formerly par to Kona (1990s) and Hilo (2010s).

Comparison period	Median single-family home price (thousand $)	Percent change (y-o-y)	Sales count
May 2016 - February 2017	199.975	11.1	724
May 2017 - February 2018	230.000	15.0	765
May 2018 - February 2019	227.500	-1.1	670

Figure 34: Home Sales Prior to Eruption (Source: Hawai'i Information Service)

The above identifies the median existing single-family home sales prices and rates of change, for selected 9-month intervals before and after the eruption, for the Puna District (TMK 1).

The following shows the Island of Hawai'i's new homebuilding trend, which is set against a backdrop of declining building permits.

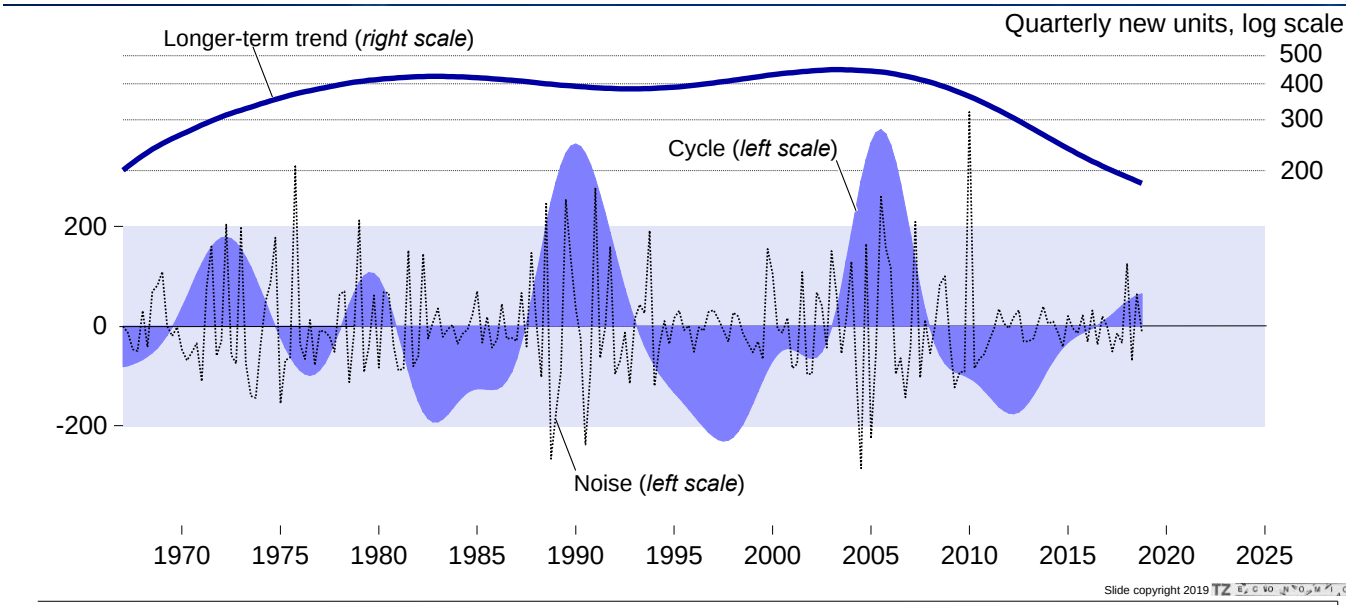
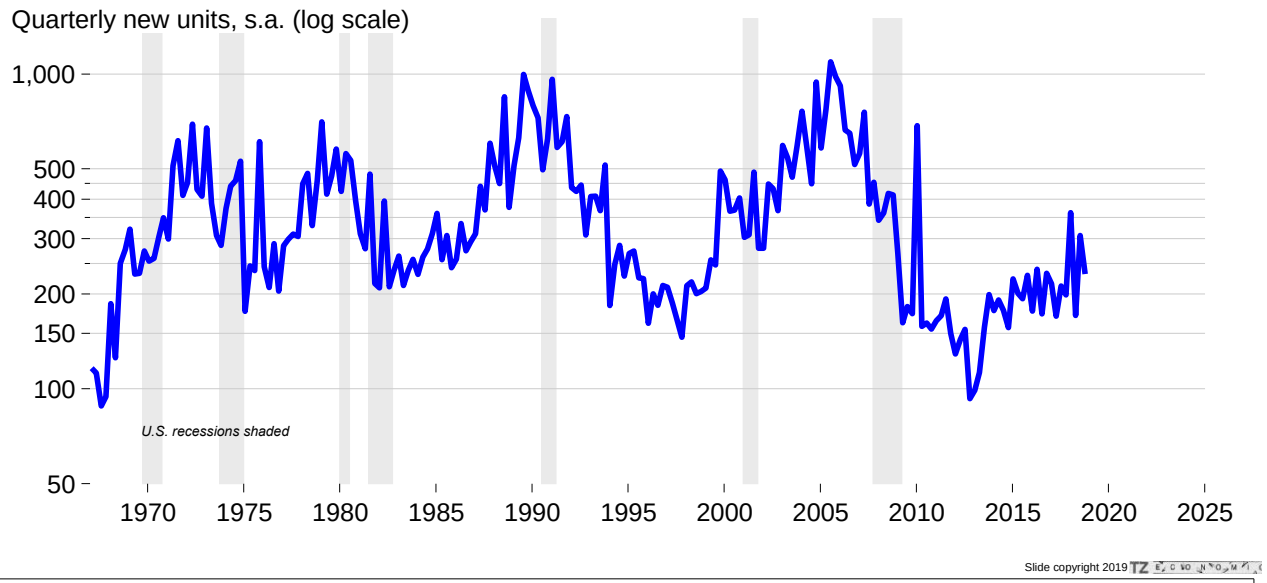


Figure 35: Hawai'i Island New Home Building



Sources: County Building Departments, Hawaii DBEDT (http://dbedt.hawaii.gov/economic/qser/selected-county-tables/), TZ Economics database; seasonal adjustment by TZE, data through fourth quarter 2018

Figure 36: Building Permit Trends

Closing Note on the Economy

To summarize, this study clearly shows that the disasters of 2018 curtailed the positive economic gains that the Island of Hawai'i was already making and projected to make. It also shows that the economic impacts were felt, not just in the directly affected areas, but island-wide. Third, it shows that these impacts will continue to put future stress, not just on the island's businesses but also on its infrastructure because of where the job centers are.

Tourism experts noted that the Fall of 2017 and first four months of 2018 were the "best ever" peak of tourism on the Island of Hawai'i. The volcanic eruption then suddenly caused the island to give up as much as 30% of its gains made during this time. The disasters underscored the County's and State's dependence on tourism and the vulnerability of its critical infrastructure, particularly roads and water.

Strengths, Weaknesses, Opportunities and Threats Analysis

At the opening of this document various goals were identified for the development of an Economic Recovery Plan. Subsequent sections of this document provided an overview of the 2018 disasters as well as economic baseline data. This section aims to further conduct analysis, which will direct recommendations to be implemented for economic recovery and resiliency on the Island of Hawai'i.

The analysis first considers the strengths and weaknesses of the economic configuration of the island. These are the assets and liabilities that affect what economic sectors can do. Additionally, this section reviews the opportunities and threats that are beyond the control of the local government or businesses. This analysis of strengths, weaknesses, opportunities, and threats is generally referenced as a SWOT analysis. Figure 37 organizes the content as a high-level overview of the most salient factors that should be considered in developing the plan's strategic recommendations.

The island's strengths allow it to perform well compared to other regions with similar populations. Its natural and cultural resources are world-famous, which naturally lends itself to tourism. Another significant economic asset is its location and microclimates. From a geospatial perspective in terms of its proximity to the equator and its air quality and night sky that is not disrupted by city lights, it lends itself to aerospace and astronomy. Agricultural expertise is also a strength in terms of available production know-how and significant resources in research, technology, and education in a semi-tropical environment.

SWOT analyses can be misleading, because a weakness can also be considered a strength and vice versa. The island's remoteness means that factor costs related to imports are expensive. However, the island's remoteness and natural assets also means that world-class experts can be attracted to research and incubate new business models and partner with outside enterprises to tap larger markets. The island is not a place to do mass production due to high costs of doing business and limited forms of resource inputs, but it could be an excellent location for certain STEM oriented businesses.

The most successful, sustainable economic recoveries are those that align with the community and existing businesses, so even though the island may lend itself to certain industries, this does not mean that they should be pursued on a large scale. Rather, businesses are most likely to be well-received if they emerge from the community. Although statistically speaking, start-up and small business support has not been a strength in the past, the ingredients are there to catalyze and provide opportunities for the future.

Other economic opportunities for the island to consider include incentivizing environmental science-based companies such as organics, biomimetics, health and wellness, environmental design, and engineering. The island also has a strong local culture and natural influences from which distinctive creative arts and fashion design can build on this base, and the reframing of the tourism industry to showcase the communities' unique natural and cultural assets.

A weakness affecting development is the high cost of infrastructure hardening, updates, and conversions. Resources are stretched thin, and yet the County and the State have already taken on significant steps to work with citizens and businesses to convert to 100% renewable energy and clean transportation by 2045 and convert cesspools by 2050.

Long-term investment needs to be made at the systems level – education and workforce development, critical infrastructure, broadband, and internet access. Additionally, more access to capital is needed for small business to industry-scale property, plants, and equipment. Such investments typically come from off-island sources and based on current statistics, this has declined.

This SWOT analysis identifies that the tourism industry dominates the Island of Hawai'i economy and is subject to disruptions due to disasters and related safety concerns. It would be wise to diversify, broadening the local agriculture sector and other businesses. The diversification of the economy was underscored in community sentiment throughout this study, but how can diversification be achieved?

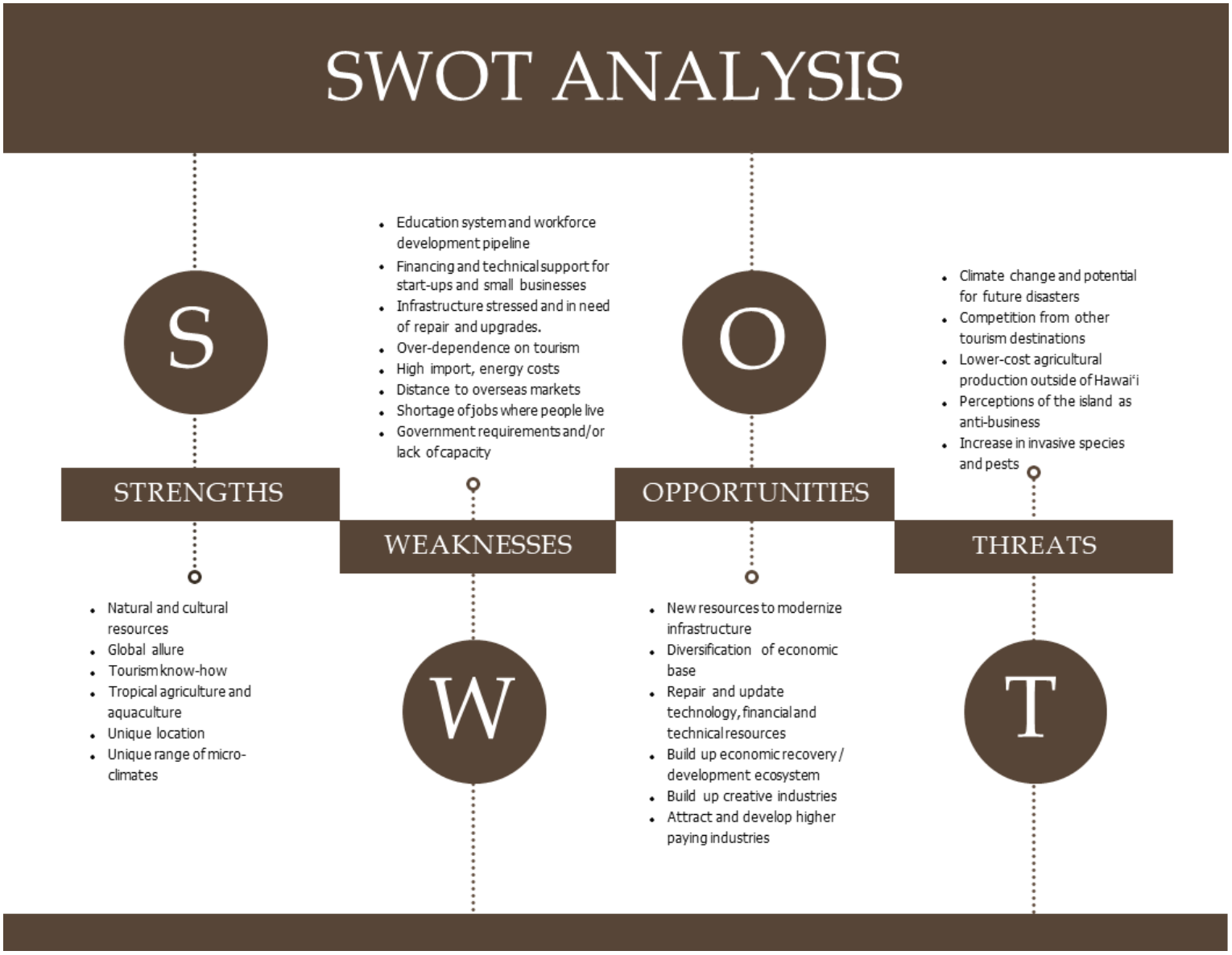


Figure 37: SWOT Analysis for Economic Development Sector on the Island of Hawai'i

Target Industry Analysis

Hawai'i's Targeted & Emerging Industries 2018 Update Report (DBEDT) reveals that numerous Hawai'i business categories are performing well when compared to the national average.[3] It may well be the island's best opportunity, not just for economic recovery but also for economic resilience, is to invest in the creative industries, research and development, health and wellness, and education.

Market Analysis

One of the first lessons of business is that the old saying "build it and they will come" rarely works. The best way to build a business is to understand what the customers want, what can be delivered, and whether there are enough customers to create the right economies of scale to assure successful outcomes.

The Island of Hawai'i can be characterized as widely dispersed small residential areas with somewhat limited services. In the directly impacted areas of the Puna district, there remains a high degree of uncertainty of buying patterns because of the extent of physical and economic disruptions. The local market in most small communities is not large enough to support large companies or many high paying jobs based on residential consumers alone. Businesses seeking to reach a certain size need to be able to tap into visitor interests, island-wide, and/or off-island markets.

How Important is the Visitor Market for the Island?

The visitor market creates the most significant source of income of the island's economy and supports many industries beyond hospitality, tours, retail, and restaurants. The sector directly employs at least 25% of the population and with multiplier effects it represents more than half of the economy, and visitors, representing 90% of the potential customer base. Before the disasters arrested growth, tourism was on its highest trajectory since the end of the 2000 financial crisis.

There are many competitors for the visitor dollar in the state and destinations around the world. In previous years, the Island of Hawai'i attracted increasing numbers of visitors as an "adventure destination" highlighted by a live volcano, which has gone "quiet" for an indeterminant length of time.

[3] The report noted that, "…the measures and classifications used in the targeted industry portfolio are descriptive but not diagnostic. That is, the measures alone do not reveal why the industries performed as they did. They also do not reveal the role of these activities in the economy. It is not clear if the high performing industries are growing independently or are feeding off growth in other activities. It is also not clear which industries are devoting their output primarily to export as opposed to local consumption markets, although the measures of concentration help identify probable export candidates. The purpose of this performance assessment is to assist economic developers.

Where the Analysis Leads

Based on this analysis, in addition to supporting the economic recovery plan's goals, identified solutions that drive economic recovery need to:

- Deliver value in terms of return on investment and economic growth to help businesses recover from disaster related losses and restore purchasing power in the population;
- Reduce risks to businesses and public assets;
- Develop alternative tourism products to compensate for lost natural assets;
- Align with the island's natural strengths and culture;
- Factor in costs and infrastructure constraints;
- Consider how the island is perceived in other parts of the world; and
- Position the island for long-term sustainable growth and resilience through economic diversification and risk management.

In terms of the existing economic platform, recouping tourism in the directly impacted area will require some infrastructure investments and development of new projects. While visitors are likely to return to normal patterns island-wide, another key finding from this analysis is that strategic communications need to be bolstered.

This leads to businesses and economic opportunities that (a) build off of the island's location and unique properties – such as agriculture, aquaculture, and aerospace, (b) do not require high shipping, energy or other significant supply chain factor costs – such as design, scientific research and development, media, online commerce, health and well-being, finance, and (c) are extensions of existing natural and cultural resources leveraging creativity. Industries such as arts, fashion, food and beverage manufacturing and cuisine, museums and heritage sites create high-paying jobs and position the island to diversify the economy and tap into growing global tourism demand, while remaining culturally authentic and environmentally friendly.

To support the direction that this analysis indicates, the County and State will have to play a key role in strengthening support mechanisms. These opportunities require education, skills-training, knowledge, and capacity building – not just K-12, but beyond, for continuing education, career transitions, and the development of new ventures. A second important mechanism is start-up culture and support for small businesses, which may include building finance acumen,

mentoring, and improved government efficiency and transparency. A third element is broadband connectivity – Hawai‘i businesses and entrepreneurs can find opportunities in the virtual economy if the electronic infrastructure is available.

As identified previously within this document, the island's business community relayed the following major goals that this Economic Recovery Plan should achieve:

Goal #1 – Respect and embrace the island's natural and cultural resources
Goal #2 – Address the directly impacted area's economic recovery
Goal #3 – Address recovery from island-wide impacts
Goal #4 – Promote future resilience and sustainability
Goal #5 – Develop the island's business and entrepreneurial support system

This section of the document further discusses these goals and identifies various objective to be pursued in economic recovery and resiliency.

Goal # 1: Respect and Embrace the Island's Natural and Cultural Resources

The appeal of the Island of Hawai'i for most residents and visitors is its abundant natural and cultural resources. The resonating connection to the 'āina drives all elements of the island's society. This deep connection to the land originates from the earliest native Hawaiians and their land use principles, founded on the sustainable and self-sufficient ahupua'a system. This 'āina-first value system permeates to today's modern society and is manifested in a multitude of ways, from educational programs to a wide range of products and services that derive value from the island's culture and bounty.

Natural and cultural resources are key assets for agriculture and tourism. One cannot put a price tag on cultural resources, but ecosystem services is beginning to be monetized and appearing on balance sheets. A recent report by the U.S. Geological Survey calculated the value of the Island of Hawai'i's protection from coastal flooding by its coral reefs at $23.9 million for buildings and $26.6 million in annual economic activity based on 2010 dollars.[4]

Objectives
Encourage entrepreneurs and business owners to develop and manage businesses and startups in a pono manner to embrace and deliver cultural experiences, ecotourism, and to honor and use natural resources in harmony with the environment and local culture.
Increase the capacity of businesses to understand the components of natural and cultural ecosystem services, how to calculate the value of those services, and to seek out existing and emerging financial incentives related to ecosystem services.

[4] Storlazzi, Curt D., Reguero, Borja G., Cole, Aaron D., Lowe, Erik, Shope, James B., Gibbs, Ann E., Nickel, Barry A., McCall, Robert T., van Dongeren, A., Beck, Michael W. 2019. Rigorously Valuing the Role of U.S. Coral Reefs in Coastal Hazard Risk Reduction. Reston, VA: U.S. Geological Survey, and U.S. Department of the Interior. https://pubs.usgs.gov/of/2019/1027/ofr20191027.pdf.

Policymakers, developers, and key enablers encouraging growth that supports self-sufficient, decentralized economic diversity and enables individuals, business owners, and businesses to survive and thrive in harmony with the core values of the island.

Individual business owners know that the government cannot compensate for changes in customer patterns, prices, technologies, and other factors, and must be prepared to fail if they cannot pivot and adapt. They should understand that the government supports businesses, as they help the island flourish, however government cannot pick individual winners and losers.

Goal #2: Address the Directly Impacted Area's Economic Recovery

Many businesses throughout the district of Puna want to recover and return to how business operated prior to the eruption, while recognizing that some things can never be the same. Thus, it is necessary to help businessowners get back on their feet by taking advantage of support systems and exploring working capital, marketing assistance, and resilience training. Some businesses will need to pivot to new models or completely new opportunities and should be encouraged to do so.

Objectives
Enhance the transportation, transit accessibility and connectivity for the Puna district as measured by traffic flow metrics reflected in reduced travel time to reach businesses, services, and jobs.
Re-establish the Pohoiki Boat Ramp to support access to the local fishery as an important economic generator and to support traditional customs and livelihoods.
Encourage the establishment and expansion of businesses and service providers in village town centers and other appropriate locations that are easily accessible to Puna residents.
Encourage existing and emerging businesses to engage in educational, cultural, and ecotourism activities that attract visitors to the district who will patronize local establishments and tour operations, and purchase locally grown or made goods.
Identify existing or establish new commercial kitchens and maker spaces to support entrepreneurs who wish to develop new products and services.
Encourage local businesses to enhance resilience practices, critical infrastructure, and understanding of economic support systems so that individually and collectively businesses are safer and reduce the risk of future losses due to extreme weather, climate, or geological events.
Increase broadband access to support business productivity and workforce development and training.

Goal #3: Address Island-wide Economic Recovery with Emphasis on Directly Impacted Sectors and Business Communities

The economic consequences of the disasters were felt across the island. Visitors did not just stay away from Puna; they cancelled reservations throughout the island. The ripple effects were felt not just by the tourism and agriculture sectors, but through finance, healthcare, business services, and all other inter-dependent business sectors. Reductions in employment occurred throughout the island.

Objectives
Individuals, businesses, community leaders, and government to identify opportunities to strengthen local communities while benefitting the island through economic diversification.
State, county, and private sector leads not just to replace but to upgrade infrastructure that they have responsibility for, replacing or relocating essential assets that were lost due to lava and hurricane damage.
Ensure that key industry and business leaders are empowered to: - move forward to make investments and create jobs - mitigate threats and increase businesses' resiliency through risk management and busines continuity plans and capabilities - align business plans with pono practices - support the diversification of businesses
For academics, practitioners, and technical experts to provide more training and technical assistance for start-ups and small businesses.
For the county and state to encourage and/or incentivize private and philanthropic funders to increase access to capital and other tools to assist small business and support a diversified economy.

Goal #4: Promote Future Business Resilience and Sustainability

After having gone through such a swift, sharp economic downturn after years of positive momentum, businesses expressed widespread determination to take steps to reduce the chances of repeat losses. More businesses should be encouraged to have individualized disaster plans for their families, businesses, and employees. Beyond the obvious benefits of being proactive in risk reduction and ensuring business continuity, safety and resilience measures will be well-received by potential longer-term investors and help with planning for the future.

There is also a second dimension to this goal: economic resilience means not being dependent on any one industry. By encouraging industry diversification and building targeted sectors, if a

downturn happens in any one sector it should limit the ripple effect throughout the entire economy.

Businesses can take various steps towards ensuring resiliency, such as having disaster and continuity of operation plans in place. Business owners should have personal disaster plans developed and encourage all employees to do the same. Businesses also need to ready themselves for disasters; invest in insurance to cover lost income/damages and be prepared to apply for federal disaster program by ensuring creditworthiness and staying up-to-date on taxes and business filings.

Objectives
Institutionalize lessons learned from the disasters to improve business resiliency and sustainability, business organizations, and individual businesses.
Elicit, engage, and secure private sector's commitment to developing businesses' individual resiliency.
The County and State will encourage the diversification of the economy through a variety of mechanisms.
Improve County and State's public information capability to deal with crisis communication and marketing needs, as measured by more rapid response times and engagement with different audiences through various forms of traditional and social media.

Goal #5: Develop the Island's Business and Entrepreneurial Ecosystem

Supporting small businesses and encouraging entrepreneurship is an economic development strategy that is most applicable to the economy on the Island of Hawai'i due to the significant percentage of small businesses. The National Main Street Program defines the Entrepreneurship System as, "...a community's local network of institutions, policies, physical infrastructure, leadership, relationships, and resources working together to influence the startup and growth of local businesses."[5]

There is no shortage of innovative entrepreneurs on Hawai'i whose chances for success could be increased by an active and connected support system. The island's remote location creates obstacles for many potential entrepreneurs trying to hone their business and marketing skills, understand labor laws and export basics, navigate regulatory processes, and find accounting and legal professionals who can provide sound advice.

[5] National Main Street Center. The Importance of Inclusive Entrepreneurship Ecosystems. https://www.mainstreet.org/home

The local business support community is comprised of government, university-based organizations, and nonprofits working independently with similar missions and goals. Despite the different organizational structure, the support community is a collegial group that can build capacity through collaboration; in fact, the 2012-2020 Hawai'i County Comprehensive Economic Development Strategy's SWOT analysis includes "collaboration" as a strength.

Shortly before the Kīlauea Eruption, several support agencies and nonprofits from around the Island began convening informally for information and idea generation with the goal to provide enhanced services for their respective business clients. Immediately following the Kīlauea disaster, this network collaborated to design a training program specifically for Puna-based businesses. The workshop programs included opportunities for one-on-one consultation with marketing and accounting professionals. That the group was mobilized and ready to implement programs illustrates the advantage of a connected support system.

This group informally called an "Economic Development Hui" (organization, alliance, team) is dedicated to supporting home-grown businesses, building entrepreneurial capacity, leveling the playing field for start-ups, and building economic response mechanisms that can be put into place immediately following a disaster. With increased capacity, this hui, operating through a compact of confidentiality and cooperation, can effectively build educational tools for a successful local small business support ecosystem, which will in turn will result in innovation and jobs within the community.

Throughout this plan's stakeholder outreach period, limited economic development capacity across the private and public sectors was cited as a concern in taking on new projects and programs that can help restore the economy and make it more resilient for the future. This concern prompted discussion regarding the public and private sectors both having a shared responsibility in the work. Best practices were discussed, including how to grow local businesses and how to improve the climate for doing business, which includes reducing costs and barriers to business operations and to employment.

Objectives
Improve ease of doing business with government at all levels: - Permitting processes should be reviewed for ease of application, review, and decision-making - Assist businesses with regulatory processes
Expand support for entrepreneurship via technical assistance and workshops.
Provide business continuity training and similar resilience programs for the small business community.
Incorporate targeted public resources to support private-led efforts.

Businesses actively seek available resources and participate in government assistance programs.

Approaches to Achieve Desired Outcomes

While there was broad consensus about the over-arching recovery goals, there were significant differences among business stakeholders about which objectives to prioritize and how to allocate resources to achieve success. Various questions were posed regarding which communities to focus upon and where funds should be expended, such as restoring lost infrastructure or prompting relocation elsewhere. Differing opinions surfaced regarding resources to be used to support low income communities. Public policy discussion included possible future use of new open space. Stakeholders questioned whether additional entrepreneurship and business retention support was desired or needed as well as how to best target new business industries that were compatible with the island's core values.

While there were many differences in opinion, six approaches surfaced as the direction the economic recovery should take (discussed below). It should be noted that these approaches may be used individually or in combination with others.

Approach #1: Focus on the Directly Impacted Area and Return Business Conditions to Pre- Eruption Status

This approach addresses the desire of impacted business owners in the Puna district to return business conditions to those prior to the eruption. The sentiment is that those who are most directly impacted should be prioritized and compensated for their losses.

This approach could entail re-opening key roads, upgrading evacuation routes, restoring the Pohoiki Boat Ramp, and replacing utilities such as water. Some stakeholders believe it is necessary to create new tourism attractions to draw visitors to the area, while avoiding unauthorized access to private property, which could provide more customers for a wide range of local businesses. Restoring access to isolated farms and the reestablishment of farms offers opportunities for productive use of impacted properties, while leverage of incentives could drive decisions to limited financial investment in geologically high risk areas. Each of these actions would require some intervention and investment by County and State government.

Approach #2: Provide Tools for Economic Recovery and Growth

Desired outcomes would include a general increase in prosperity in the Puna district and across the island through business retention and expansion and the creation of higher paying

jobs that would reduce the need for people to work multiple jobs. More services and jobs would be created closer to housing to reduce travel times for services and commute times – or as an alternative, public transportation would be provided to assist in getting people to work and services.

Industry diversification and innovation would increase so that there would be more economic resilience in the future. Of necessity, the County cannot stand alone in this endeavor. A network of businesses, entrepreneurs, and support services must be established to assist growth and sustainability. The County can assist with technical support and expertise.

A second key premise of this approach is equity for all. The best way forward is to empower individuals and businesses to seek opportunities, innovate, grow, and create across the island.

Approach #3: Place-Based Development

Place-based development builds on existing community, cultural, and natural assets of a town or region. Traditional land uses and settlement patterns have given the Island of Hawai‘i communities distinctive attributes and assets. Growth should be consistent with and reflective of these assets.

Future redevelopment in Puna should incorporate the goals of the Puna Community Development Plan, which advocates for Regional Town and Village Centers while retaining the pre-disaster spirit of the affected communities. Similarly, other community development plans should direct future growth and development in other districts throughout the island.

Approach #4: Cluster-Based Economic Development

Cluster-based economic development can be a means to diversify the economy, encourage innovation that will reverse the brain drain, and site industries in appropriate places. A succinct definition of cluster-based economic development is provided by the International City/County Management Association (ICMA): “Clusters are geographic concentrations of competing and collaborating firms that tend to produce innovation and higher than average wages.”[6]

This approach builds on the effectiveness and value of creating business clusters and focusing attention on the rise of the creative class and other demographic attractors.

[6] ICMA. 2012. *Cluster-Based Economic Development Strategies.* ICMA. https://icma.org/articles/cluster-basedeconomic-development-strategies.

Local stakeholders identified areas for future development and expansion of value-added agriculture, pono-tourism, and the creative economy as a means to leverage the synergy of business clusters.

For agriculture, there is recognition that high costs of doing business and significant production risks impede significant growth opportunities despite the high demand and necessity for local food security. To offset those negative factors, niche opportunities were identified to expand the agriculture industry through value-added products, services such as "farm to table" restaurants, agri-tourism visits and farm-stays, and branding of products produced on the island.

Pono tourism builds on the economic capacity of communities and villages with strong identity of their culture and physical presence. Visitors are eager to venture to locations with recognizable character to learn about the local culture, spend time and money absorbing and enjoying the host culture and its offerings.

Cluster-based economic development lends itself well to the creative economy where the synergy of the arts – music, dance, theater, as well as the tangible arts including ceramics, painting, jewelry, and crafts. Shared workspaces, galleries and exhibition events draw locals and visitors generating direct economic activity and exponential exposure through blogs, magazine articles and social media exposure. On the business side of the creative economy there are opportunities to connect to necessary services such as accountants, media professionals, and technical services for further business development and stabilization.

The cluster-based economic development model can become a driver to a more diversified economy, generating profitable businesses, and creating new opportunities for entrepreneurs. With further busines activity, it stands to reason that there would be more services and opportunity for jobs that are closer to where people live.

Approach # 5: Natural and Cultural Conservation

Stakeholders recognize that Hawai'i's natural and cultural resources have significant economic value in addition to the intrinsic values these resources represent to a healthy environment and society.

This approach does not accept the premise that economic growth for the sake of profits or jobs alone is good, particularly if it destroys or damages natural and cultural resources. Technology and innovation are welcomed in this approach, as science and innovation can conserve important assets, build new economic activities, and expand research opportunities that complement environmental and social assets.

The desired outcome of this approach is development rooted in ʻohana, āina, and the rural character of the community while making investments in clean energy and enhanced mobility and connectivity. Stakeholders want to empower small farms, elevate cultural sites, and direct tourism development in a manner that is pono and respectful. An important outcome is to strengthen communities and eco-systems, and to build up social and natural capital to preserve the character of the island.

Approach #6: Reinvent and Transform

Following a disaster, the opportunity exists to "reinvent and transform" because of the additional resources that are made available for recovery. The community has an opportunity to reset and reinvent certain elements of the island's image, with the economy potentially more focused on distinctive island culture, nature, and traditions. Naturally, ideas about how to reinvent and transform are as varied as the population.

Community planning efforts need to incorporate demographics, anticipate population growth, and plan for convenient and reliable transportation to employment and commercial areas. Land use plans and zoning should be structured and enforced to address concerns about climate change, hurricanes, sea level rise, volcanic and other natural disasters. Modern technology, new materials, and smart infrastructure should be incorporated into plans and physical improvements.

The public and private sector need to coordinate on workforce development and retention. Stakeholders raised concerns about filling vacant positions, employee training, managing the "brain drain" from the island as people seek higher paying jobs in other locations, and addressing long commutes for employees.

Businesses should also be encouraged and assisted in becoming compliant with all laws. This will assure businesses pay their fair share and are able to qualify for government programs that can assist in post-disaster and normal operating times.

In this approach, investments should focus on clean industries. To achieve revitalization, significant public and private investment in critical infrastructure and facilities should be made in Pāhoa, Volcano, Keaʻau, and other communities, not based on short-term considerations but what the island will need for future generations.

This Economic Recovery Plan is tailored to the island's realities and reflects the goals and aspirations of our people and business community. It considers the island's uniqueness and the constraints of its geography.

Stakeholder Roles

Economic recovery must be placed in the context of larger issues and a plan for economic recovery can only be successful when a wide range of stakeholders play active and contributing roles. County government has limited resources and can lead, fund, enable, plan, zone, encourage, and discourage. However, it is the private business sector that drives and sustains the economy and its development. Economic recovery objectives need to be shared and internalized by individuals, businesses, and supporting organizations.

The county and state have roles in both building internal economic development support capacity and empowering community and business partners. The County government can be an important catalyst to leverage capabilities and assets of:

- The island's natural and cultural resources
- Community entrepreneurs, start-ups, and small businesses
- State and Federal partner agencies
- Large companies (purchasing power)
- Investors (social impact investors, angel investors, and venture capitalists)
- High net worth residents and business owners
- Traditional and community development financial institutions
- Philanthropic sector
- Technical experts and educators on the island
- Visiting technical experts and educators

Businesses and industry groups can continue to strive towards self-reliance, strengthen industry associations, engage in huis ("club, group, organization"), and increase their own capacity. Businesses should have proper levels of insurance and exercise sound business planning

concerning information, equipment, and facilities. Business continuity plans should also consider the needs of employees and how to ensure back-up capacity and cross-training in the event an emergency prevents anyone from working.

Industry-Focused Recovery Considerations

One of the findings that emerged in preparing this economic recovery plan is that stakeholders hold a range of perspectives about the importance and mix of various industries. The sectors identified with significant importance to the Island's economy include:

- Tourism
- Agriculture and Aquaculture
- Health and Wellness
- Real Estate, Housing, and Construction
- Science, Technology, Engineering, and Mathematics (STEM)
- Creative Arts

Feedback from stakeholders, regarding these sectors, was assembled and is attached in Appendix B. This feedback is a snapshot of industry consideration, upon which recovery recommendations were developed that align with the Economic Recovery Plan goals:

Goal #1 – Respect and embrace the island's natural and cultural resources
Goal #2 – Address the directly impacted area's economic recovery
Goal #3 – Address recovery from island-wide impacts
Goal #4 – Promote future resilience and sustainability
Goal #5 – Develop the island's business and entrepreneurial support system

The following **Strategic Recommendations** have been developed to guide economic recovery and resiliency. It should be noted that this document further drills down with potential economic recovery initiatives that might be implemented (see Appendix C).

Recommendation 1: Place-Based Development Aligned with the Island's Natural and Cultural Resources

Goals Addressed:

- ✓ Respect and embrace the island's natural and cultural resources
- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability

Place-based development strategies can lead to differentiation, diversification, and local economic opportunities while preserving a community's sense of place. The Kaʻū Coffee Festival is an example of place-based tourism springing out of Kaʻū's award-winning coffee production. The village of Holualoa features a cluster of artisans, which attracts visitors to experience the village's art galleries, restaurants, and overnight accommodations. Similarly, Honokaʻa preserves a unique western and plantation heritage to draw visitors and residents alike.

The Island of Hawaiʻi place-based visitor events, including the Merrie Monarch Festival and the IRONMAN World Championship, are significant examples of economic generators. Many smaller visitor attractions including agritourism, sports, and health/well-being, etc. serve to bring investment, visitor spending, and general economic activity to communities throughout the island. Residents naturally share what they love and commercial enterprise develops in alignment with the characteristics of the community.

"Sense of place" is a compelling and grounding effect that can instill a sense of purpose within the community to effect change. Resident and business owner sentiment was unified and strong in the desire to retain the valued nature and characteristics of each business community and the island as a whole.

For the Puna district, including its village town centers, subdivisions, and natural and cultural areas, future economic development should be guided by the place that is Puna. To that end, the Puna Community Development Plan (CDP)[7] and the appointed Puna CDP Action Committee can provide guidance, input, and lend consistency to the community's shared vision for the future.

Many residents and businesses in the Puna District are linked to Hilo, which is the seat of government, higher education, and the location of airports and seaports. Hilo is also a key employment center for Puna's residents and a gateway for visitors whose itineraries include HVNP and Kilauea's lava flows. Hence, while much of this Plan is focused on strengthening

[7] The Puna Community Development Plan can be found on the County of Hawai'i's website at https://www. hawaiicountycdp.info/puna-cdp.

communities that were directly impacted by the disaster, strengthening the sense of place of communities island-wide will help to generate more opportunities.

Various tactics can be used, island-wide, to support this recommendation. Such tactics could include place-making as a general principle and the continued implementation of Community Development Plans. Environmental studies may be undertaken to inform future place-making and commercial decisions. Collaboration should be promoted between businesspeople, economists, and educators to help forecast markets, demand, and skill requirements. Another tactic may involve education and providing resources to the visitor industry that will encourage "Pono Tourism."

Key Elements of the Recommendation:

- To support this strategy from the ground up, community business leaders, entrepreneurs, curators of community natural and cultural resources, and key stakeholders need to identify local place-based opportunities (e.g. agriculture, health spa, restaurant, specialty manufacture, consumer goods, furniture, food, beverages, fragrances, etc.).

- Identify pre-existing features and small business clusters that can be built on in each community – unique coffee, honey, natural features, historic landmarks, unique trails and paths exist across the island – local products based on local knowledge have the best chance of succeeding.

- As a pilot, local community leaders and key stakeholders might identify, designate, or develop spaces for start-ups and small businesses to develop in Puna, particularly Pāhoa and Kea'au.

- Encourage investment and build out of local unique offerings and small businesses.

- Encourage development of local community economic spaces island-wide, including commercial kitchens, internet cafés, maker spaces, and hubs.

- Encourage deepening of expertise, differentiation of product, and continued investment in development.

- Promote the community's distinctiveness through place-making signage and other communications.

> "We need to promote local agriculture, promote real long-term businesses to move here, lessen taxes to get business and people here, promote the island as a place to LIVE AND STAY." - Business survey respondent

> "We need to look at making the county more affordable for the local population; give heed to tourism but don't sell out for it." - Business survey respondent

Recommendation 2: Capture and Share the Island's Culture of Learning to Develop a Workforce of the Future

Goals Addressed:

- ✓ Respect and embrace the island's natural and cultural resources
- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability
- ✓ Develop the island's business and entrepreneurial support system

Workforce development is a long-term, ongoing process, and has been recognized by the educational and business communities as the key to economic diversification, growth, and reversing the "brain drain" trend. Although workforce development strategies will not address a short-term economic recovery focus, the importance of this strategy bears attention.

The State of Hawai'i's Comprehensive Economic Development Strategy for 2016 – 2020 identified the need to focus on STEM education as a strategy to strengthen the local economy. In response, the Hawai'i Department of Education adopted new science and computer science standards to prepare students for participation in the global economy. The University of Hawai'i developed two initiatives, (1) the Hawai'i Graduation Initiative[8] which includes a strategy to align programs with community and workforce needs (the number of STEM degrees awarded is one of the initiative's measures of success), and (2) the Hawai'i Innovation Initiative[9] that focuses on diversifying Hawai'i's economy by partnering with the business community to link scientific discovery with applied research and economic development.

The Hawai'i P-20 Partnerships for Education (Hawai'i P-20) Council has set a goal of "55 by 25" where 55 percent of Hawai'i's working age adults will have a two- or four-year degree by 2025. Hawai'i P-20 collaborated with the Hawai'i State Department of Education and the University of

[8] http://blog.hawaii.edu/strategicdirections/hawaii-graduation-initiative/
[9] http://blog.hawaii.edu/strategicdirections/hawaii-innovation-initiative/

Hawai'i to create a College and Career Readiness Report (CCRI) which is available through an online database hosted by the Hawai'i Data Exchange Partnership (DXP).[10]

Key Elements of the Recommendation:

- Forecast needed skills and knowledge according to jobs that are offered by the state, county, and local businesses.
- Forecast business opportunities and skill requirements to meet the workforce pipeline needs such as data science and analytics, artificial intelligence and machine learning, distributed ledger (blockchain), 3D printing, and robotics.
- Work with chambers of commerce and business organizations to support Junior Achievement of Hawai'i Island and agriculture professionals to support local Future Farmers of America and 4-H chapters.[11]

> "I want us to thrive not just survive. Our children should be able to get a quality education for a family without moving to the mainland to attain such a thing."
> - Business survey respondent

A key part of the economic recovery is to develop a system that provides meaningful and relevant job and skill training in high school and continuing education. In this case, the Island can leverage several of its assets such as:

- Skills and expertise of residents, and visiting experts sharing their knowledge
- University of Hawai'i at Hilo, Hawai'i Community College, Hawai'i Community College at Pālamanui
- Small Business Development Centers, private accelerators, and public-private partnerships such as the Hawai'i County Workforce Development Board

In many dated economic development plans, the three legs of the economy were identified as agriculture, tourism, and defense. In the future, more jobs and economic opportunities are going to revolve around information, science, technology, engineering and mathematics, and creative industries. Developing the island's workforce development capacity will help it to prepare for this future.

[10] http://hawaiidxp.org/
[11] https://jahi.org/

SAMPLE EDUCATIONAL-BASED ACTIONS
K-12 Education
Work with skills and career nonprofits like Junior Achievement, FFA, FHA, and FIRST Robotics to build on after-school programs.
Encourage employees to volunteer and mentor and share their work experiences.
Encourage student participation in business case competitions, investment clubs, and science fairs.
Higher Education
Develop Business-Economist-Labor-Academic Roundtable to share insights and experiences on a regular basis.
Develop incubators tied to UH and HCC for student entrepreneurs.
Encourage visiting academics, practitioners, investors, and business leaders to guest lecture and hold workshops.
Other
Encourage apprenticeships and internships by individual businesses.
Encourage local business case competitions and "hackathons".
Encourage local academics and business organizations to identify local kupunas and subject matter experts and create programs to capture island-knowledge.

Fig. 38: Educational-Based Actions

"We need to improve the opportunities for good paying jobs in this country and this should be priority number one. If people are making good pay, everything else will follow. They will be able to buy or rent decent homes, provide for their family, have good and healthy food to eat, stimulate the economy for entrepreneurs who open restaurants, stores, and services, etc." - Community survey respondent

Recommendation 3: Enhance the Economic Development Support System

Goals Addressed:

- ✓ Respect and embrace the island's natural and cultural resources
- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability
- ✓ Develop the island's business and entrepreneurial support system

Given the range of the economic losses incurred from the 2018 disasters, it would be prudent to spread responsibilities for the work of recovery. While it is common to think of economic development as strictly a function for government at either the county or state level, the economic development ecosystem that supports recovery must include a broader range of contributors that each play a vital role. It is the business owners and entrepreneurs who are key initiators and implementors in any economy.

Throughout the development of this plan, more than 100 organizations on the island of Hawai‘i and across the state were identified that can support some aspect of recovery. These economic development organizations may be public, private, or public-private partners. A listing of these organizations is provided as Appendix D of this document.

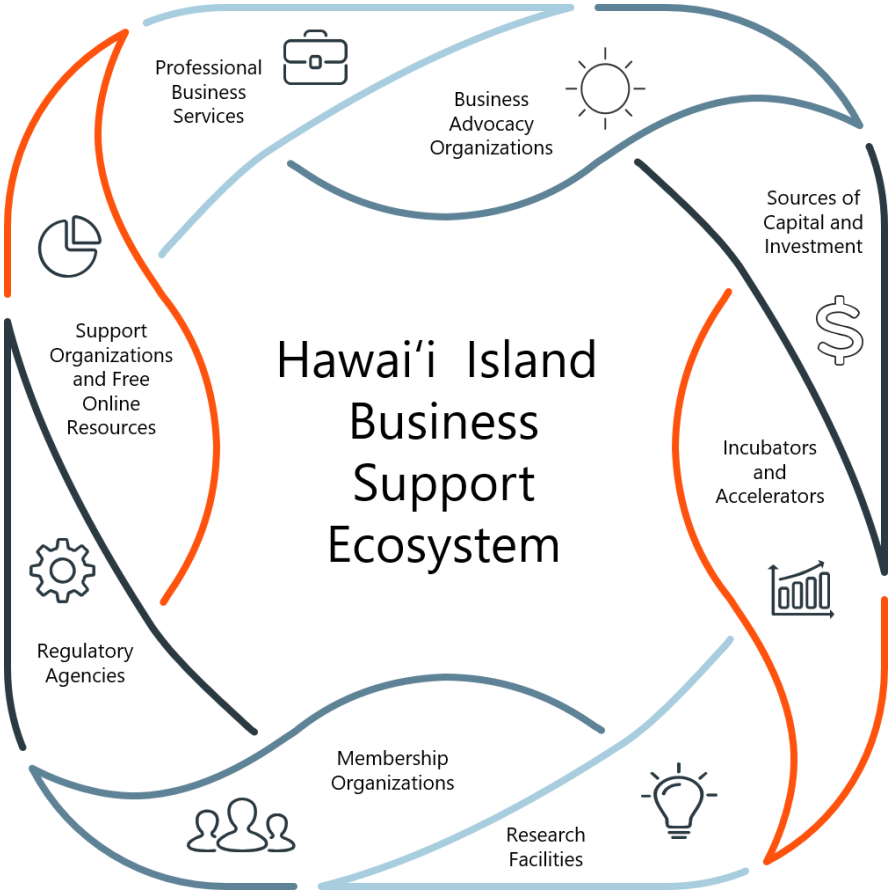


Fig. 39: Economic Development Ecosystem, Hawai'i Island

Key Elements of the Recommendation:

- Empower private, nonprofit, and other public business support organizations including incubators, chambers of commerce, SBDCs, and community-led huis to support economic recovery.

- Building and maintaining the economic development support system to implement the plan will require active cooperation between government, business, academic and other key stakeholders. The recovery process will only proceed as fast as critical functions can proceed.

Recommendation 4: Maximize Opportunities to Utilize Incentives to Promote Economic Growth

Goals Addressed:

- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability
- ✓ Develop the island's business and entrepreneurial support system

Economic development incentives are used across the country to encourage private sector firms to relocate, create jobs, invest in communities, and strengthen local industries.[12] Economic incentives offered by federal, state and county government include tax exemptions and credits, tax deferrals and related benefits, and waiver of import tariffs. Appendix E offers a summary of available incentive programs.

Key Elements of the Recommendation:

- Educate property owners, developers, and businesses regarding availability of existing incentive programs, including provision of technical assistance relating to derived benefits, applicability, applications, and compliance.

- Assess emerging needs and opportunities to create new incentives to support business development, expansion, and investment for future economic and community growth. Such incentives may be derived from government, the private sector, or public/private agreements.

- Enhance the understanding of available state and federal grant and low-interest loan programs and provide technical assistance including business readiness, application, and compliance with program requirements.

[12] Parilla, Joseph, and Sifan Liu. 2018. Examining the Local Value of Economic Development Initiatives. Washington, D.C.: Brookings Metropolitan Policy Program. https://www.brookings.edu/wp-content/uploads/2018/02/report_examining-the-local-value-of-economic-development-incentives_brookings-metro_march-2018.pdf

Recommendation 5: Invest in Critical Infrastructure

Goals Addressed:

- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability
- ✓ Develop the island's business and entrepreneurial support system

One of the critical components for the success of businesses in any jurisdiction is access to necessary infrastructure. Water, wastewater, transit and transportation to and from job sites, shopping, and school sites for children, childcare and health care for family members, internet connectivity, cellular service, access to affordable energy — all of these things add up to enhancing the quality of life for recovering businesses and communities. As a matter of fiscal responsibility, however, public policy needs to balance infrastructure investment with risk management. For example, expending funds for infrastructure in a high hazard area may result in future infrastructure damage (such as by a lava flow) whereas the risk of damage to infrastructure investment may be decreased if physically installed in a low hazard area.

Most of the neighborhoods in Puna were built as residential and agricultural communities. Work was found in Hilo or elsewhere. Therefore, relative to its population size, the district is underserved by gas stations, supermarkets, and other retail and employment opportunities. This is also why adequate transportation access to and from Puna to Hilo is a critical factor in the economic well-being of the district.

Puna also has some of the most affordable housing in the state of Hawai'i. This affordability is based on numerous factors such as 1) environmental vulnerability due to volcanic activity, 2) the district being underserved commercially, 3) the majority of the roads being private and in substandard conditions, and 4) some areas lacking electrical power and telecommunication access.

A prudent economic recovery strategy cannot just focus on trying to create jobs in rural areas, nor can it just focus on recovering jobs in town centers. The infrastructure on both sides of this equation must be built up – from the conversion of the cesspools as required by the Environmental Protection Agency and the State; expansion of connectivity in rural communities; and transit and transportation options connecting rural residents to job centers.

While investing in critical infrastructure will deliver important long-term benefits, particularly for more densely populated areas, this strategy is not intended to be pursued at all costs and in all locations. Risk, usage, and cost factors need to be considered. Creating market incentives to

convert cesspools and adopt clean energy solutions will help business leverage resources to achieve long-term goals as well. New financing models need to be explored.

To borrow a concept from environmental studies, every community has a certain level of carrying capacity for its population and economy. In nature, the population of the birds and other fauna are regulated by the access to food, shelter, water, predators, and other factors. In a community, various factors play a similar role such as housing, road patterns, energy costs, zoning, and parking.[13]

Key Elements of the Recommendation:

- Invest in water and wastewater infrastructure to facilitate commercial development in Puna's town centers, which serve as economic anchors and assure natural resources are protected.
- Invest in Hilo and Kona water, wastewater, and sewage upgrades to support the diversification of these critical economic hubs.
- Convert old, obsolete, or counter-productive infrastructure to more resilient, efficient, and technologically advanced solutions.
- Invest in information and communications technology infrastructure.
- Reduce dependence on fossil fuels, including expanding the spectrum of renewable energy sources, hydrogen-based energy, solar, wind, and geothermal energy.
- Develop transit and transportation solutions designed to improve workforce commutes, business traffic, and supply chain integrity.

Recommendation 6: Build Financial Capacity

Goals Addressed:

- ✓ Respect and embrace the island's natural and cultural resources
- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability

[13] For a more in-depth infrastructure discussion see the Kilauea Recovery Strategic Plan. All recovery related infrastructure investments should be made in alignment with that plan.

✓ Develop the island's business and entrepreneurial support system

Financial management understanding, capacity, and access to capital are essential for local businesses to survive and thrive. Coordination between public and private sector organizations and institutions will lead to increased capacity and leveraging of resources.

Key Elements of the Recommendation:

- Expand current small business support programs that provide technical assistance in cash flow basics, bookkeeping, creating financial projections, and accessing funding for entrepreneurs and small businesses.

- Develop and expand financial workshops, counseling and technical assistance programs in partnership with SBDCs, financial institutions, and nonprofit organizations on business credit basics and assessing insurance needs; and programs such as USDA Rural Development's Rural Energy for America Program[14], DBEDT's Hawai'i State Trade Expansion Program[15]; Hawai'i Technology Development Corporation's Manufacturing Assistance Grant Program and Hawai'i Small Business Innovation Research Program.[16]

- Work with wealth management and philanthropic experts on the island to develop an "Invest in the Island" impact investment fund for high net worth individuals who wish to give back.

- Identify and work with angel investment and venture capital networks to invest in Hawai'i Island businesses.

- Work with seed funding from federal agencies and donors to replenish and expand a revolving loan fund (RLF) to finance recovery, start-up, and resilience initiatives for impacted small businesses. Place the RLF at a local community development financial institution and partner with an outreach organization to promote and provide technical assistance to applicants.

[14] https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systemsenergy-efficiency
[15] https://invest.hawaii.gov/exporting/histep/
[16] https://www.htdc.org/money/

> "Market forces will prompt private investment when effective partnerships between government, community residents and business demonstrate a real commitment to moving forward with realistic strategic plans for creating sustainable commercial centers in and/or close to population centers."
> - Community survey respondent

Recommendation 7: Strengthen Recovery Communications and Outreach

Goals Addressed:

- ✓ Respect and embrace the island's natural and cultural resources
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability

According to a JPMorgan Chase study of 600,000 small businesses, most small businesses typically have less than six months of "rainy day" funds, insurance, and other sources of capital which enable them to replace inventory, plant, property, and equipment—and half have less than 27 days of cash reserves. Researchers, dating back to Daniel Alesch's work after the Northridge Earthquake in California, have noted that a secondary round of losses takes place six to 18 months after a disaster. This phenomenon occurs because customers change their purchasing patterns and businesses do not have enough continuing business to replenish their reserves. In some cases, this decline is due to lack of accessibility, but in other cases, it simply due to perceptions of the disaster area.

The west side of the Island of Hawai'i saw the return of tourists within six months of the disaster as hotels and others that rely on tourism began aggressive marketing. However, because visitors are so vital for Hawai'i's economy, positively and actively managing and curating the island's image and brand going forward is essential.

Key Elements of the Recommendation:

- Elevate the function and capacity for strategic communications of Hawai'i Tourism Authority and the county.
- Review existing communications with Asian and Mainland target visitor audiences.
- Review and enhance communications with the island business community.

- Review and enhance communications with business and financial-focused media companies.

Recommendation 8: Promote Future Economic Resilience on the Island of Hawai'i

Goals Addressed:

- ✓ Respect and embrace the island's natural and cultural resources
- ✓ Address the directly impacted area's economic recovery
- ✓ Address recovery from island-wide impacts
- ✓ Promote future resilience and sustainability
- ✓ Develop the island's business and entrepreneurial support system

Developing a prudent economic resilience strategy for the future is not just a luxury. It is a necessity to avoid repetitive losses, the same kinds of dislocations and damages that were recently experienced, and to maintain and protect the lives, livelihoods and living environment of the island residents and businesses.

Unfortunately, 50 percent of the world's extreme weather events happen in and around the Pacific Ocean. Hawai'i is frequently in the path of hurricanes as they form over warm water near the equator and move north. A changing climate around the Pacific Basin is increasing the likelihood of more intense storms. Climate risk management is increasingly on the radar screen of many major companies and the government. Impacts from extreme weather and rising seas affect site selection, insurance rates, supply chains, factor costs, and can cause ripple effects throughout business operations.

Future volcanic, earthquakes, landslides, and tsunami – are not a question of if but when for the Island of Hawai'i. The threats and risks are significant, and the capacity to prepare and respond is the collective responsibility of government, businesses, residents, and communities. Preparation for, and responses to, extreme events and chronic stresses can be managed to a certain extent. There are several key components for helping businesses and the economy become more resilient.

At the business level, businesses need to develop business continuity plans. These plans should not just take into account securing plants, property, and equipment, but also promote financial resilience (build a 4 to 6-month rainy day fund), energy resilience (back-up generation), water and sanitation resilience, and technology resilience (back up of critical records off-site).

Businesses also need to be aware of and anticipate their interdependencies and human context. If employees' houses and personal situations are harmed, they often cannot come to work. If

the roads are inaccessible, other essential infrastructure is damaged or the power is off, businesses may not open. If schools are closed and children are home, employees may not be able to come to work. None of these situations are under the control of the individual business, but they affect whether a business is open or closed, and for how long.

At the macro-economic level, industry diversification is a necessary means to resilience. Promoting risk management, at both the individual business and island-wide levels, must also be a core strategy.

The County of Hawai'i aims to promote future economic resilience on the island through the development and implementation of the 2018 Kīlauea Disaster Economic Recovery Plan as well as the Kīlauea Recovery and Resilience Plan. These efforts are based on the National Disaster Recovery Framework, which categorizes recovery into the following periods: Response (short term), Transition (intermediate term), and Long-Term Recovery (long term). This framework not only guides government decisions but also has significant relevance to businesses in managing risk for their individual sectors and circumstances.

Key Elements of the Recommendation:

- Create a mutual feedback loops for communications, coordination, and collaboration between government and the private sector.
- Develop ongoing program of business resilience training workshops and technical support.
- Work with the business community to survey readiness for potential risk scenarios.
- Work with the insurance industry to understand threat/vulnerability outlook for commercial property.
- Support small business development of business continuity plans.
- Promote economic diversification island-wide.

Anticipating the Future

The recovery process from the 2018 disasters will not be easy or short-term but given the collaborative nature of the economic development support system, the island has a good chance to rebound better than before. It is imperative to acknowledge threats and variables that lie ahead and make educated choices to 1) minimize repeat losses and 2) maximize long-term benefits of proposed investments.

Threats that can jeopardize this recovery include:

- Extreme weather and climate-related phenomena including sea level rise, ocean acidification, erosion, and subsidence
- Volcanic and geological instability
- Economic downturns
- Health challenges
- Decline in morale
- Sensationalized media/social media stories and negative perceptions

Variables that may impact this recovery include:

- Population increase or decrease
- Technological advances
- Competition from other destinations
- Infrastructure management
- Cost increases or decreases associated with energy, health care, and shipping

The implementation of long-term recovery and building resilience may prompt additional studies to be conducted or plans to be developed. It often requires other mechanisms to be established, such as codes, regulations, design standards, programs, and policies or procedures to move from planning to action. These mechanisms can also help to institutionalize the lessons learned and successes of long-term recovery which in turn build resilience within the County and community to be better prepared for natural disasters in the future.

Investment Areas

Both the public and private sectors hold essential roles in the success of economic redevelopment and resiliency. The business community and government have an opportunity to invest in upgrades, hardening, and other measures that reduce future threats where the exposure to hazards can be mitigated; and to invest in infrastructure and promote growth in areas with reduced physical and financial risk. Now is the time to invest in the island's

infrastructure, financial capacity, and people. This is also a time for education, entrepreneurship, and environmental stewardship.

Investment Examples

It is evident that transportation infrastructure must be improved, not just for connectivity purposes to allow people to get more easily to work, shopping and services destinations, but also for safety and security reasons.

Water, wastewater, and energy infrastructure needs to be expanded to better serve village centers and reduce the costs of doing business, improve the standard of living, and better support core industries such as small business and agriculture. While the General Plan and Community Development Plans establish county-wide policy, in their implementation they should be adapted to reflect the differing community characters and acknowledge the reality of fiscal constraints. As such, infrastructure investment should be scaled to the level of settlement, whether at the parcel or district levels, and occur with a lens of where growth should be encouraged. In the recovery process following a disaster infrastructure should be planned where communities can and plan to rebuild with full knowledge of hazard exposure and the risk of repetitive losses from future disasters. Recovery can also provide an opportunity to double down on investments in infrastructure in ways that a community may not have had the resources or plan to prior to the disaster.

Internet access, broadband connectivity, and enhanced cell phone coverage is needed so that wherever people live or do business on the island there is equal opportunity to pursue education, entertainment, and commerce.

Small businesses' lack of access to capital indicates that the island could seek to empower robust Community Development Financial Institutions, angel investor, venture capital, and small business capacity building infrastructure.

Evaluating Success

Key performance standards should be developed to provide the ability to evaluate a plan's success. Yet, challenges often arise during the implementation process due to lack of agreement concerning desired outcomes, expectations, and perceived progress. To say the economic recovery is complete when there is a return to pre-existing job numbers or a certain metric (such as per capita income or GDP) is met, it may not be effective in reaching a higher degree of economic resiliency. Furthermore, strengthening of critical infrastructure can take an extended time due to strenuous federal funding and permitting requirements.

For these reasons, it is important to consider a dashboard of key performance indicators for successful economic recovery which could include those listed below.

Key Performance Indicators					
Business	**Market**	**Infrastructure**	**Public Systems**	**Workforce Development and Employment**	**Future Extreme Events and Disasters**
- Existing business recovery, retention, and expansion - Number of start-up companies - Economic diversification and growth of targeted industries - Business investment and access to new capital - Reduction in business exits and bankruptcies - Economic leakage: strength of exports versus imports - Strengthening of essential supply chains and industry clusters - Reduced commute times - Reduced business debt	- Consumer confidence - Business confidence - Resident satisfaction surveys - Visitor numbers, average length of stay, average daily spending - Visitor satisfaction surveys by market - Visitor numbers to island attractions in different locations	- Asset repair - Asset relocation - Asset hardening - Service availability for communications and internet access - Increase in renewable energy and reduction in cost of power - Transportation access by air, sea, and within the island - Safety	- Performance evaluations - Customer service feedback - Increased government efficiency as measured in reduced processing times - Increase in taxes and fees because of business growth (versus rate increases)	- Expanded educational opportunities and training options for targeted industries - Jobs created - Jobs saved - Unemployment rate - Improvement in educational attainment - Workforce participation rate	- Fewer businesses damaged or destroyed - Reduction in negative economic impact - Reduction in duration of future recovery - Reduced time to re-open business

Fig. 40: Key Performance Indicators

It is very difficult to establish a timetable for determining success since every community and industry is different. The implementation of the above-identified recommendations, and associated economic recovery initiatives, is not all-inclusive of possible options. This plan invites all sectors of the community to act collaboratively to advance the recovery, readiness, and resilience strategies for the Island.

Appendix - A: Largest Employers on the Island of Hawai‘i

	BUSINESS NAME	STREET	CITY	BUSINESS DESCRIPTION	EMP. RANGE
1	Hilo Medical Center	Waianuenue Ave	Hilo	Diagnostic Imaging Centers	1,000-4,999
2	Kohala Spa	Waikoloa Beach Dr	Waikoloa	Hotels & Motels	1,000-4,999
3	Hilton Waikoloa Village	Waikoloa Beach Dr	Waikoloa	Hotels & Motels	500-999
4	Hilton	Lua Kula St	Waikoloa	Resorts	500-999
5	Hapuna Beach Prince Hotel	Kaunaoa Dr	Kamuela	Hotels & Motels	500-999
6	Hale Ho'ola Hamakua	Plumeria St	Honokaa	Hospitals	500-999
7	Mandara Spa At Mauna Kea Beach	Mauna Kea Beach Dr	Kamuela	Spas-Beauty & Day	500-999
8	Hawaii County Police Dept	Kapiolani St	Hilo	Government Offices-County	250-499
9	Kona Community Hospital	Haukapila St	Kealakekua	Hospitals	250-499
10	Four Seasons Hualalai	Kaupulehu Dr	Kailua Kona	Hotels & Motels	250-499
11	Walmart	E Makaala St	Hilo	Department Stores	250-499
12	Mauna Kea Beach Hotel	Mauna Kea Beach Dr	Kamuela	Hotels & Motels	250-499
13	Hawaii County Public Works	Pauahi St	Hilo	Government Offices-County	250-499
14	Walmart	Henry St	Kailua Kona	Department Stores	250-499
15	Hawaii County Fire Department	Kinoole St	Hilo	Government Offices-County	250-499
16	Marriott Waikoloa Beach	Waikoloa Beach Dr	Waikoloa	Hotels & Motels	250-499
17	Roberts Hawaii Tours	Kanalani St	Kailua Kona	Tours-Operators & Promoters	250-499
18	Mauna Lani Bay Hotel	Mauna Lani Dr	Kamuela	Hotels & Motels	250-499
19	KTA Super Stores	E Puainako St	Hilo	Pharmacies	250-499
20	North Hawaii Community Hospital	Mamalahoa Hwy	Kamuela	Hospitals	250-499
21	Life Care Center of Hilo	W Kawailani St	Hilo	Rehabilitation Services	250-499
22	Courtyard King Kamehameha's	Palani Rd	Kailua Kona	Hotels & Motels	250-499
23	Mauna Loa Macadamia Nut Corporation	Macadamia Rd	Kea‘au	Macadamia Nuts	250-499
24	Hawaii Police Department	Kapiolani St	Hilo	Government Offices-County	250-499
25	Pāhoa High & Intermediate School	Pāhoa Village Rd	Pāhoa	Schools	100-249

	BUSINESS NAME	STREET	CITY	BUSINESS DESCRIPTION	EMP. RANGE
26	Hawaii County Internal Affairs	Kapiolani St	Hilo	Government Offices-County	100-249
27	Do It Best Rental Center	Kanoelehua Ave	Hilo	Hardware-Retail	100-249
28	Hilton Bay Club Waikoloa Beach	Waikoloa Beach Dr	Waikoloa	Hotels & Motels	100-249
29	Costco Wholesale	Maiau St	Kailua Kona	Wholesale Clubs	100-249
30	Wyndham Kona Hawaiian Resort	Alii Dr	Kailua Kona	Hotels & Motels	100-249
31	Sheraton Kona Resort Spa	Ehukai St	Kailua Kona	Hotels & Motels	100-249
32	Kamehameha Elementary School	Volcano Rd	Kea‘au	Schools	100-249
33	Kai Restaurant	Ehukai St	Kailua Kona	Restaurants	100-249
34	Hilton Grand Vacations	Waikoloa Beach Dr	Waikoloa	Resorts	100-249
35	Metzler Contracting Co LLC	Kohala Mountain Rd	Hawi	Building Contractors	100-249
36	James W Glover Limited	Leilani St	Hilo	Concrete-Ready Mixed	100-249
37	Puna Certified Nursery Inc	South Rd	Kurtistown	Nurserymen	100-249
38	Macy's	Kamakaeha Ave	Kailua Kona	Department Stores	100-249
39	Pittsburg Tank & Tower Co	Holoholo St	Kailua Kona	Contractors-Engineering General	100-249
40	Huggo's Restaurant	Kahakai Rd	Kailua Kona	Restaurants	100-249
41	Hilo High School	Waianuenue Ave	Hilo	Schools	100-249
42	Johnson & Assoc Tax Svc	Lunapule Rd	Kailua Kona	Tax Return Preparation & Filing	100-249
43	Waiakea High School	W Kawili St	Hilo	Schools	100-249
44	Royal Kona Resort	Alii Dr	Kailua Kona	Resorts	100-249
45	Home Depot	E Makaala St	Hilo	Home Centers	100-249
46	Hilo Hawaiian Hotel	Banyan Dr	Hilo	Hotels & Motels	100-249
47	Kea‘au Middle School	Kea‘au Pāhoa Rd	Kea‘au	Schools	100-249
48	Kaiser Permanente Medical Care	Hualalai Rd	Kailua Kona	Clinics	100-249
49	Lowe's Home Improvement	Hale Kapili St	Kailua Kona	Home Centers	100-249
50	Waiakeawaena Elementary School	Kīlauea Ave	Hilo	Schools	100-249

	BUSINESS NAME	STREET	CITY	BUSINESS DESCRIPTION	EMP. RANGE
51	Jan Guard Hawaii Inc	Kuakini Hwy	Kailua Kona	Security Systems Consultants	100-249
52	Clark Realty Corp	Kuakini Hwy	Kailua Kona	Real Estate	100-249
53	Target	E Makaala St	Hilo	Department Stores	100-249
54	Life Care Center of Kona	Kamehameha III Rd	Kailua Kona	Nursing & Convalescent Homes	100-249
55	Kaiser Permanente Kona Med Offices	Honokohau St	Kailua Kona	Physicians & Surgeons	100-249
56	Arc of Hilo	Waianuenue Ave	Hilo	Cognitive Dev Disability Svcs	100-249
57	Custom Metal Roofing	Melekahiwa St	Kea‘au	Roofing Materials-Wholesale	100-249
58	Kukio	Mile Marker	Kailua Kona	Resorts	100-249
59	Queens Court Restaurant	Banyan Dr	Hilo	Restaurants	100-249
60	Target	Makala Blvd	Kailua Kona	Department Stores	100-249
61	Hale Anuenue Restorative Care	Waianuenue Ave	Hilo	Skilled Nursing Care Facilities	100-249

Prepared by: Hawaii State Dept of Labor and Industrial Relations, Research and Statistics Office, https://www.hiwi.org, 7/14/17. Employer information is provided by InfoGroup®, Omaha, NE 800/555-5211.

Appendix - B: Industry-Focused Recovery Considerations

One of the findings that emerged from the process of preparing this plan is that stakeholders have very strong ideas and opinions about different industry sectors. Because of the range of perspectives, and the importance of the industry mix to the island, this section was developed to provide brief snapshots of industry perspectives. Various initiatives may be executed by business and government, in partnership, to help the island recover economically.

This is not intended to suggest that government should incentivize every industry. There are many instances of subsidies and other direct interventions that have not worked. Government should create an enabling environment that allows different ideas to emerge so that the community at large benefits.

Tourism Sector

Throughout the development of this plan it was stressed that the community seeks tourism recovery, however there is a desire to "reset" tourism so that it better reflects core values of the community including:

- Promoting culturally and environmentally sensitive tourism practices through greater emphasis on community and nature-based tourism
- Harmony with the environment and culture
- Exploring potential for low-impact nature-based tourism in the Puna impact area appropriate to risks and land use policies and private property rights
- Developing and promoting pono practices in the tourism industry to engender respectful visitor behavior
- Working with community-based organizations to promote Hawai'i Volcanoes National Park as a place of biodiversity and dynamic change, while focusing tourist programs on conservation and preservation
- Encouraging tourists to visit the rest of the island outside of tourist resorts, with a focus on promoting island heritage
- Embedding respect for natural and cultural resources for all future tourism product development that significantly impact sensitive locations.

Insights and Aspirations

- "Hawai'i Volcanoes National Park was the product everyone came for previously. Now the island needs new products to promote."
- "The County needs to benchmark what other counties are doing in terms of strategic communications and be competitive. Visitors have a choice of islands, and there are a lot of other places that are competing for their attention too."

- "It would be interesting to see a new attraction developed to give people an opportunity to understand and learn about what happened with the 2018 eruption in the Puna area, perhaps an add-on to the national park with a drive from the Chain of Crater to Kalapana.
- "We should promote the island as an 'open science lab' … oceanography, astronomy, geology, volcanology, nature and bird watching, botany and culture would be excellent for science lovers."

Agriculture and Aquaculture

Agriculture generated some of the most enthusiastic responses in terms of future opportunities, but not in terms of "business as usual." There was a general recognition that traditional farming offered thin margins and was unlikely to generate significant income-generating jobs. What many stakeholders shared is a strong desire to reinvent the agribusiness landscape by developing specialty, higher value products, a so-called "Agriculture+" strategy. By tapping into creative industry strategies, leveraging the unique growing conditions, and sharpening the distinctive qualities of products, many believe this process of reinvention will accelerate the economic recovery.

Insights and Aspirations

- The funding that would be most helpful for the recovery of businesses directly impacted by the 2018 eruption would be loans and grants for businesses, including farms (SBA, FSA, RD).
- The University of Hawai'i's College of Tropical Agriculture researchers and extension agents are highly regarded due to their unique knowledge.
- The "Hawai'i" brand has been indiscriminately used. Hawaiian words used with non-local products are proliferating. Strategic efforts should be made to manage the Island's brands.
- Avoid reinventing the wheel:
  - Review inventory of existing agriculture and aquaculture businesses to identify existing strengths and opportunities
  - Develop robust information sharing mechanisms
  - Conduct market scan including future trend analysis
  - Benchmark what peers and near peers are doing
- Move from a traditional agriculture model focused solely on production to value-added agriculture model.
- Empower private initiatives and support groups:
  - Support/enable business case and local produce competitions
  - Explore how natural and cultural assets can appeal to the senses, including fragrances and cosmetics, natural medicines, and other applications

- Raise awareness about the unique micro-climates – this has the possibility of making the island a center for environmental studies, biomimetics, biologics, natural supplements, exotic fragrances.
- Support the development of purchase collaboratives to buy local:
  - Call attention and recognize what hotels, restaurants and retailers do to buy local
  - Help farmers gain more economies of scale
- To become more self-sufficient, island residents must figure out ways to reinvent and scale up the production of food. At the present time it is less expensive to get something grown and shipped half-way around the world than to produce on island.
- Support the acquisition of equipment and facilities that can be shared through co-ops and use agreements to assist farmers and businesses in developing value-added merchandise.
- A research and development center is critical, especially in developing ways to respond to global competition.
- Farmers must learn to "harden the farm" in face of growing challenges – climate and invasive virus/disease. Risk mitigation is required. Location is critical in agriculture – so need to think strategically about risk and environmental factors.
- Online sales and specialty crop sales – key is diversity and constantly offering new product. This is hard as there are fewer and fewer new varieties due to fewer younger farmers and breeders.
- Future needs: Artificial Intelligence and robotics in farming – mechanization is a way to address potential lack of future farmers.
- More research on countering disease and invasive species.
- Access to capital is critical for all farmers.

Health and Wellness

Health care is the fastest growing economic cluster in the U.S. and Hawai'i. The demand for health care and wellness-focused care will continue grow as Hawaii's population continues to age. Currently, those age 65 and older account for 17% of Hawaii's population and estimates indicate that nearly 40,000 elderly (or 20% of the population) will require long-term care by 2030. While the Hilo Medical Center is the island's largest employer, the health care employment sector includes a broad range of traditional and alternative care options and wellness centers. Significant challenges remain with attracting a skilled workforce, addressing economies of scale for medical businesses in rural settings, and low wages for medical professionals.

Insights and Aspirations

- Greater access to more health care providers and specialist capacity.
- Residents also need ease of local transportation to medical care.

- Residents do not want to have to travel off island to seek advanced care, which represents additional hardship beyond the illness.

Real Estate, Housing, and Construction

Housing recovery is an essential component of economic recovery in providing safe and affordable places for the island's workforce, families, and retirees to live. In addition to the loss of 723 structures or 612 homes, the island already had a shortage of housing (before the 2018 disasters) that is affordable to a range of incomes within the community, as evidenced by a large homeless population. This is a critical issue faced by Hawai'i communities due to a shortage of affordable housing and the challenge of matching jobs and population centers.

The Island of Hawai'i existing single-family home median sales price appreciation slowed since the last recession's recovery in 2011, recently to a three to four percent annual rate of increase. The Kona side of the island has rebounded significantly more than the Hilo side.

Insights and Aspirations

- Develop affordable housing in areas convenient to job centers and infrastructure capacity (Keaau, Waikoloa, Hilo, etc.), while focusing on maintaining the Island of Hawai'i's rural, small town character.
- Support the redevelopment of Banyan Drive, the peninsula's environmental study, and the State's leasing of land.
- Rather than encouraging sprawl, the public and private sectors need to come together to develop high density, walkable town centers.
- Establish a public/private construction/housing task force to work through critical challenges facing the construction industry, including improvements to the application and permitting process.
- Review and update the Building Code where appropriate to incorporate new technology and building methodologies, as well as lessons learned from disasters and pending climate change impacts.

Science, Technology, Engineering and Mathematics (STEM)

With its diverse microclimates over a large rural area, and with both high and low elevations, Hawai'i is in many ways an ideal location for scientific exploration and development.

Average earnings in Hawai'i's technology sector are relatively high, at $81,849 in 2018. Over a decade from 2008 to 2018, renewable energy generation had the strongest job growth among the technology industry, although the total jobs were still relatively small at 312 jobs.

A lack of internet connectivity in many areas of the island is a challenge for some communities. More than 9,000 residents on the Island of Hawai'i do not have access to any wired internet, nor

do they have access to 25 Mbps broadband. In Pāhoa, only 61% of residents have access to wired providers (BroadbandNow 2019). A survey by the County of Hawai‘i stated that greater connectivity was the number one desire by island youths as it currently limits education, entertainment and communication with friends and family. The lack of connectivity is also seen as a safety hazard for some communities.

Aerospace is a growth industry in creating and sustaining an “innovation economy”. The aerospace sector of Hawai’i’s economy (statewide) represented 5.5% of State GDP, or approximately $4 billion. The largest segment of Hawai’i’s aerospace industry (72%) comes from civil aviation, including flights in and out of Hawai’i, helicopter tours, and ancillary support services (refueling and maintenance).

The astronomy sector had a total impact of $167.86 million statewide, with the largest impact in the County of Hawai‘i of $91.48 million (University of Hawai’i 2014); There are 12 facilities for Astronomy housing 13 research observatories representing 11 nations on Mauna Kea. Protests against additional development in 2019 catalyzed a statewide debate on the stewardship of public land for private uses and industrial development for scientific research at sites of cultural significance.

Insights and Aspirations

- With significant community input, identify the most appropriate high-technology science, astronomy, aerospace, and aviation opportunities that align with community values and cultural sensitivities.
- Improve science and engineering programs at University of Hawai‘i at Hilo, as well as primary school STEM curriculum.
- Promote more research, development and technology learning facilities that will foster innovation, help prepare residents for higher paying jobs, and attract students and scientists to the island.
- Increase connectivity and improve communications infrastructure.

Creative Arts

The Island of Hawai’i has a vibrant creative arts community, in large part due to the inspiration provided by its natural and cultural resources. Hawai’i is a natural incubator of local talent, fostering a creative base that is recognized both across the state and around the world.

Preservation and conservation of natural and cultural resources is essential, as these resources serve as artistic inspiration. Native Hawaiian and the local creative arts community provide continual promotion and fostering of the Island’s inspiration. This can be accomplished through the development of an island-wide artistic hui, representing all artistic fields. This group could convene to build upon mentorship programs to develop new talent, providing kupuna with

opportunities for the transmission of artistic and cultural tradition. The hui would also look to other creative communities, indigenous and otherwise, around the world to benchmark strengths, weakness, opportunities, and obstacles.

Insights and Aspirations

- Creation of a creative industry hui that focuses on development of young, local talent and draws on the expertise of kupuna.
- Expansion of culinary training programs in both Hilo and Kona, including a greater emphasis on farm-to-table and food tourism programs.
- Development of business management training platforms for creative arts professionals, including training on financial aspects of creative industry entrepreneurship and business plan development.
- Construction of a multipurpose performance facility with built-in sound stage.

> "Invite, entice, educate, train, promote, acknowledge more participation of and create more opportunities for local Hawai'ian folk in businesses particularly related to nature, parks, ocean, outdoors, cultural and historical sites and events."
> - Business survey respondent

Appendix - C: Selected Economic Recovery Initiatives

As an outcome of in-depth stakeholder engagement and the analysis of economic development strategies the project team for this plan developed a list of potential economic recovery initiatives that could be aligned with following Economic Recovery Plan Goals:

Goal #1 – Respect and embrace the island's natural and cultural resources
Goal #2 – Address the directly impacted area's economic recovery
Goal #3 – Address recovery from island-wide impacts
Goal #4 – Promote future resilience and sustainability
Goal #5 – Develop the island's business and entrepreneurial support system

The initiatives were identified to be most feasible to move forward towards implementation. The initiatives include both government-supported efforts at the local and state levels as well as community-based and private sector-driven projects, some of which already have progress underway.

The initiatives are both short- and long-term. Initiatives may take shape over many years. Measuring and communicating progress is important for maintaining momentum and keeping with the vision. Timelines are proposed to provide direction on the progress and completion of specific initiatives, and are defined as:

- Ongoing: Progress is underway and/or long-term collaboration
- Near-Term: 1-2 years
- Medium-Term: 3-5 years
- Long-Term: More than 5 years

Pāhoa Master Plan	
This initiative involves the development a Master Plan for Pāhoa, the regional town center that was hardest hit by the Kīlauea Eruption. The objective of this initiative is to secure the professional services of a qualified planning consultant to develop a new detailed Regional Town Center Master Plan for Pāhoa. The development of the plan will involve a collaborative effort that engages a variety of stakeholders and community. The process will culminate in an integrated document that reflects the needs and desires of the landowners and the community. The master plan will help direct future decision-making as it relates to the orderly growth, revitalization, and sustainable development of Pāhoa town. The plan will provide a framework for the development of future public policy pertaining to development, redevelopment, infrastructure improvement and expansion, streetscaping, and provision of community services over the next 20 years. Major issues and areas of focus that the new master plan will address will include: Wastewater Feasibility Study and Recommendations; Future Land Use; Economic Development; Transportation and Circulation; Parks and Open Space; Community Services; Urban Design; Environmental and Cultural Resources; and Implementation.	**ACTION STEPS** • Engage a consultant to prepare a Regional Town Center Master Plan • Work with Puna Community Development Plan Action Committee and community on engagement and input to the master plan **POTENTIAL FUNDING** COH, EDA **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery Goal #4 – Promote future resilience and sustainability	**PROJECT LEAD** Planning Department **PROJECT PARTNERS** Puna CDP Action Committee

Workforce Development Hub	
This initiative will support workforce development needs (skills, K-12, technical assistance). A workforce development hub will be created to leverage and advance the work of Hawai'i Community College in Hilo and at Pālamanui. Hilo and UH-Hilo Early Start program, university visiting scholar and mentorship programs, and networking with multi-use/multi-functional platform managers/owners across the island "push" work stream and "speakers bureau" to visit each village multi-use/multi-functional platform. A focus will be placed on K-12 education in public and charter schools and mentorships. Efforts will be made to create a complete workforce development center that provides on-the-job training, internships, apprenticeships, continuing education, distance learning, life-skills support system, and mentorship.	**ACTION STEPS** • Convene partners from education sector • Identify community and private sector partners, including project sites **POTENTIAL FUNDING** EDA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** UH-Hilo, Hawai'i Community College, Workforce Development Organizations

Natural and Cultural Resources Management Plans	
This initiative will foster planning for natural and cultural resources management in Puna. The effort will consider new open space created through recovery activities, such as buyouts or transfer of development rights, and incorporate consideration of risks from volcanic and other hazards. Management plans will be required for new geological features formed by the 2018 Kīlauea eruption as well as culturally or archaeologically sensitive areas adjacent to infrastructure and public access. The area of Kumukahi is one such place of focus. Through this initiative, natural and cultural resource protection and preservation priorities will be identified. Access and use of the area for community-based natural resources restoration, cultural practices and interpretation, agriculture, and recreation will be explored. The potential to extend the Ala Kahakai National Historic Trail will be evaluated as well as opportunities for properly managed economic activities, such as ecotourism, at specific sites. The planning process would involve conducting field assessments, engaging stakeholders in planning for managed access and use, and incorporating lessons from other management models.	**ACTION STEPS** • Convene stakeholders for area management plan with managed public access at Kumukahi • Develop scope for long-term management plan of properties acquired through voluntary housing buyout program • Identify additional sites for further study **POTENTIAL FUNDING** EDA, CDBG-DR **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery Goal #4 – Promote future resilience and sustainability	**PROJECT LEAD** Recovery Team **PROJECT PARTNERS** Cultural Practitioners, Land Stewardship Organizations, Homeowner Associations, Visitor Industry Stakeholders, Puna CDP Action Committee

Maker Space and Business Incubator in Pāhoa	
This initiative aims to create a maker space and business incubator in Puna in partnership with local business organizations such as Mainstreet Pahoa Association, economic development support organizations such as the Small Business Development Center or HIplan, and local entrepreneurs. The effort can provide an anchor for promoting community development and serve as a hub for supporting small business development and workforce development sessions as well as provide community meeting space.	**ACTION STEPS** • Identify community and private sector partners to develop programming and maintenance of space • Identify potential locations with build-out
ECONOMIC RECOVERY GOALS Goal #2 – Address the directly impacted area's economic recovery Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**POTENTIAL FUNDING** EDA, Private **TIMELINE** Medium-Term **PROJECT PARTNERS** Local Economic Development Organizations, Businesses

Broadband Feasibility Study	
Internet access is necessary for education and will also provide new opportunities for businesses, particularly those that are home-based. The island currently has many gaps in service. Small populations in some areas make it non-economically viable for providers to construct broadband facilities. Taking matters into their own hands, some businesses have created mobile hot spots, but these may not be adequate for the long-term. The project will determine the feasibility of internet service installation to fill the critical need of access to outside markets, businesses assistance, educational resources, and development options in the area. Once completed, the project will provide long-term economic growth, support business development, and create new jobs throughout the island.	**ACTION STEPS** • Develop scope for study • Identify and secure funding for the study • Procure services to complete the study **POTENTIAL FUNDING** EDA, USDA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Recovery Team **PROJECT PARTNERS** Private Telecommunications Providers, Public Works

Transit and Multi-Modal Transportation Master Plan Implementation	
Accessible, reliable and affordable public transportation was identified as a top connectivity issue and need for the Puna region during community engagement conducted through the Recovery process. Improvements to the mass transit system within the County of Hawai'i can assist in providing alternative methods of transportation to residents for access to jobs and services within Puna and other districts, creating greater economic opportunity. The goals articulated in the County Transit and Multi-Modal Transportation Master Plan, issued in August 2018, are key components to establishing these long-term services. This initiative aims to broaden transportation options for residents, businesses and those visiting Hawai'i. Many jobs are situated at locations other than where the workforce resides, resulting in long commute times. Safety concerns have been identified for various roads, in addition to numerous roads/bridges that are impacted by seasonal flooding. Alternative sites will be reviewed as well as collaboration with other state and county efforts, which could include incorporation as a State TOD destination and library branch.	**ACTION STEPS** • Execution of proposed new mass transit bus routes for Puna • Continued phased approach to establishing the full hub and spoke system recommended to serve Puna, including selection of sites **POTENTIAL FUNDING** COH, Federal Operating Assistance Grant, Passenger Fares **TIMELINE** On-going
ECONOMIC RECOVERY GOALS Goal #2 – Address the directly impacted area's economic recovery Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Mass Transit Agency **PROJECT PARTNERS** Puna CDP Action Committee, Planning Department, Research and Development

Recovery Revolving Loan Fund	
This initiative seeks to develop a Recovery Revolving Loan Fund. This will provide businesses micro-loans or low-interest recovery loans to tide over businesses with a proven past customer base until business returns to normal. The program can be used for targeted purposes, industries, or locations to help diversify the economy and provide for development or improvement of town centers. There are best practices and lessons learned from loan and grant programs to businesses provided to mitigate the economic impacts from the COVID-19 pandemic.	**ACTION STEPS** • Identify partners and sources of capital • Develop program design and eligibility terms **POTENTIAL FUNDING** EDA, USDA, Private **TIMELINE** Medium-Term
ECONOMIC RECOVERY GOALS Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Community Development Financial Institutions, Commercial Lenders

Island of Hawai'i Marketing and Crisis Communications Plan	
This initiative is aimed to counteract negative public perceptions off the island about the extent of the damage, danger, and vulnerability. Capacity needs to be developed to manage a 24-hour media cycle and social media should there be another disaster. This effort should include the development of umbrella and unique messaging for each community, to include dedicated website(s) or microsites, videos/testimonials, and active curation of local distinctiveness. This initiative aligns with the "Pono Based Communication" goals of the Hawai'i Island Tourism Strategic Plan 2020-2025, and will necessitate coordination between leaders from the government, visitor industry, and the communities.	**ACTION STEPS** • Draft marketing and communications plan • Convene private sector stakeholders for input **POTENTIAL FUNDING** EDA, USDA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** Local Economic Development Organizations, Businesses

Volcano Arts Center – Experience Volcano	
Businesses in the region have suffered from the lack of tourism. This initiative will assist businesses with product development to help encourage visitation. This private-sector driven effort will expand an existing art and interpretive center in Volcano. The effort aligns with the "Responsible Tourism" goal of the Hawai'i Island Tourism Strategic Plan 2020-2025 and lifts up the objective to put "community first" and help to ensure communities retain their sense of place.	**ACTION STEPS** • Support Volcano Arts Center through implementation of Tourism Strategic Plan **POTENTIAL FUNDING** EDA, Private
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery	**TIMELINE** Near-Term **PROJECT LEAD** Volcano Arts Center

Hawaiian Heritage Site Development and Support	
This initiative aims to develop support for Hawaiian Heritage and heritage sites on the island. The effort will study the potential to develop and open more historical and heritage sites. Tourism product development, that could benefit local residents and businesses, will be considered. This initiative will contribute to tourism diversification and avoid tourism that is strictly "volcano-centric."	**ACTION STEPS** • Implement through Tourism Strategic Plan **POTENTIAL FUNDING** EDA, Private
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery Goal #3 – Address recovery from island-wide impacts	**TIMELINE** Medium-Term **PROJECT LEAD** Research and Development

Island of Hawai'i Rebranding Campaign	
This initiative seeks to develop rebranding based on distinctiveness per community. The island's rebranding is very important, particularly since the disaster affected public perceptions. The branding of the past has been viewed as overly dependent on the volcano, while the current desire is to promote heritage and nature. This initiative aligns with the "Pono Based Communication" goals of the Hawai'i Island Tourism Strategic Plan 2020-2025, and is grounded in place-based values and pono practices.	**ACTION STEPS** • Implement through Tourism Strategic Plan **POTENTIAL FUNDING** EDA, HTA, Private **TIMELINE** Medium-Term
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery Goal #3 – Address recovery from island-wide impacts	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** Visitor Industry Organizations and Businesses

Pāhoa Lava Zone Museum	
Following the 2018 eruption, the Mainstreet Pāhoa Association started the Pāhoa Lava Zone Museum to tell the story of the eruption and showcase items from the closed Jaggar Museum in Hawai'i Volcanoes National Park. The museum helps fill a need for interpretation and education and gives visitors a place to go to learn about the eruption that does not result in trespassing on private property. The association plans to expand the museum at another location in Pāhoa and build it as a destination. This effort aligns with the "Responsible Tourism" goal of the Hawai'i Island Tourism Strategic Plan 2020-2025, and strengthens the connection between appropriate community-led initiatives, visitors and economic opportunities.	**ACTION STEPS** • Invest in site expansion and infrastructure **POTENTIAL FUNDING** EDA, HTA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery	**PROJECT LEAD** Pāhoa Lava Zone Museum **PROJECT PARTNERS** Mainstreet Pāhoa Association

Business Advisory Council	
This initiative builds on the monthly Economic Development Hui concept to develop a Business Advisory Council with support from outside business entities. The effort seeks to engage existing businesses on an ongoing basis to help with various economic development projects, initiatives, and problem solving. The Business Advisory Council can support and participate in implementation of this Disaster Economic Recovery Plan as well as business retention and expansion opportunities in response to the economic impacts of the COVID-19 pandemic.	**ACTION STEPS** • Confirm business stakeholders to participate • Develop Council structure **POTENTIAL FUNDING** EDA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** Local Economic Development Organizations, Businesses

Marketing and Support for Incentive Zone Programs	
Hawai'i has various incentive zones that are available for growing and diversifying the business sector. This initiative proposes to expand the local use of Opportunity Zones, Foreign Trade Zones, and Enterprise Zone through such approaches as increased marketing and coordination. This initiative can support the implementation of this Disaster Economic Recovery Plan as well as business creation and expansion opportunities in response to the economic impacts of the COVID-19 pandemic.	**ACTION STEPS** • Identify business and employer organizations • Develop marketing **POTENTIAL FUNDING** EDA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** Local Economic Development Organizations, Businesses

Business Retention and Expansion Program	
The County has no current formalized business retention program, which is identified as an economic development "best practice". This initiative will consider adding a business retention function to the County government, such as through the Research & Development Department. The effort could explore securing funds to contract with the Small Business Development Center/Chambers of Commerce to build a business retention program (see IEDC training). This initiative may to include a county-wide entrepreneurship tracking program, ongoing tracking of costs of doing business, and engaging a Business Advisory Council.	**ACTION STEPS** • Identify business and employer organizations **POTENTIAL FUNDING** EDA, Private **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** Local Economic Development Organizations, Businesses

Pohoiki Boat Ramp Access – State DLNR	
The accumulation of sand and rock from the 2018 Kīlauea eruption filled in Pohoiki Bay and created a new beach that isolated the boat ramp. Pohoiki Bay was the island's third most productive commercial fishing harbor. The reduction in access to both commercial and subsistence fishing in Puna has impacted the local economy and the subsistence of lawai'a. The Pohoiki Boat Ramp is managed by the State Department of Land and Natural Resources (DLNR), which was preparing to start a feasibility study about potential locations for its reconstruction/replacement. In response to input from fishermen, and projected limited availability of funds for building a new boat ramp, DLNR announced in September 2020 that the study would be deferred and plans to dredge the ramp would move forward. Sources of funding for the project include $1.5 million appropriated by the State Legislature and assistance from the Federal Emergency Management Agency. Dredging is anticipated to be completed in 2021.	**ACTION STEPS** • Coordinate and collaborate with DLNR on progress to restore boat access at Pohoiki Bay **POTENTIAL FUNDING** State Capital Improvement Budget, FEMA Public Assistance Program **TIMELINE** Near-Term
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery	**PROJECT LEAD** State Department of Land and Natural Resources **PROJECT PARTNERS** Recovery Team

Fairs and Festival Program	
This initiative focuses on increasing participation in local fairs and festivals, through increased involvement in training program as well as integrating multiple economic sectors: tourism, agriculture, natural and cultural resources. The effort would sharpen the messaging and raise awareness about existing festivals to attract more visitors. The initiative could result in a fall counterpart to Merrie Monarch as well as other adventure sport-related festivals to complement the Ironman. The initiative aligns with the "Responsible Tourism" goal of the Hawaii Island Tourism Strategic Plan 2020-2025 and provides opportunities for visitors to authentically engage and contribute back to Hawaii Island, and be accountable for their actions. Such in-person activities are temporarily on hold due to concerns over the spread of COVID-19 or may have to develop strategies to conduct activities remotely.	**ACTION STEPS** • Work with fair and festival organizers through implementation of Tourism Strategic Plan • Support fair and festival organizers to pivot to remote events **POTENTIAL FUNDING** EDA, Private **TIMELINE** On-going
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery Goal #3 – Address recovery from island-wide impacts Goal #4 – Promote future resilience and sustainability Goal #5 – Develop the island's business and entrepreneurial support system	**PROJECT LEAD** Research and Development **PROJECT PARTNERS** Local Economic Development Organizations, Businesses

<table>
<tr><th colspan="2">Business Planning and Targeted Industry Training for Tour Operators in Puna</th></tr>
<tr><td rowspan="3">Visitors are currently looking for opportunities to see the volcano and impacted areas from the 2018 eruption. It would be preferable to have tour operators guide visitors, for personal safety, and for the protection of the environment and private property. This initiative contemplates requesting the Hawaii Tourism Authority to expand its current training program to include a targeted two-year program for visitor-industry businesses, particularly tour operators who were affected by the Kīlauea eruption. Participants in the program will strengthen their business models through a training curriculum that include: readiness for certification by the Sustainable Tourism Association of Hawai‘i; small business operations; marketing assistance; ocean and terrain safety; introduction to Hawai‘i island’s natural resource assets; industry best practices that emphasize thoughtful, Pono tourism; education on food safety regulations and all relevant regulations; cultural competency; and business planning.

This effort aligns with the 'Responsible Tourism" goal of the Hawaii Island Tourism Strategic Plan 2020-2025. The Department of Research & Development will support this program in collaboration with Hawaii Tourism Authority’s extensive partnership network including but not limited to: Island of Hawaii Visitors Bureau; Hawai‘i Island Visitors Bureau; Hawai‘i Volcanoes National Park; Sustainable Tourism Association of Hawai‘i; the Hawai‘i Tourism Authority; Native Hawaiian Hospitality Association; the Hawai‘i Small Business Development Center; State of Hawai‘i Department of Commerce and Consumer Affairs; State of Hawai‘i Department of Land and Natural Resources; and the National Oceanic and Atmospheric Administration. This program will help build resilient entrepreneurs and improve the Island’s visitor industry product, by focusing on today’s visitor looking for experiential travel opportunities with little environmental footprint.</td><td>ACTION STEPS
Implement through Action Cohorts convened through the Tourism Strategic Plan
Recruit Visitor Industry Businesses to participate
Recruit instructors and cultural practitioners with knowledge of focused places to develop curriculum and design the program</td></tr>
<tr><td>POTENTIAL FUNDING
EDA, HTA, Private</td></tr>
<tr><td>TIMELINE
On-going</td></tr>
<tr><td>ECONOMIC RECOVERY GOALS
Goal #1 – Respect and embrace the island’s natural and cultural resources
Goal #2 – Address the directly impacted area’s economic recovery
Goal #3 – Address recovery from island-wide impacts
Goal #4 – Promote future resilience and sustainability
Goal #5 – Develop the island’s business and entrepreneurial support system</td><td>PROJECT LEAD
Research and Development
PROJECT PARTNERS
Visitor Industry Organizations and Businesses</td></tr>
</table>

Puna Wastewater Programmatic Environmental Impact Statement (PEIS)	
The purpose of this programmatic environmental impact statement (PEIS) is to do an assessment that will allow the County to make informed choices of planning alternatives for wastewater infrastructure in commercial centers in the Puna district, and for potential impacts and benefits of those alternatives. The Recovery Team worked with the Departments of Environmental Management (DEM) and Research and Development on an application for funding to the EDA which is expected to be awarded. The PEIS will provide several options, cost estimates, and implementation guidance to move forward with necessary infrastructure improvements.	**ACTION STEPS** • Inventory existing water and wastewater systems • Analyze existing wastewater conditions • Conduct feasibility analysis • Evaluate wastewater treatment master plan • Prepare financing analysis • Implementation plan • Public outreach **POTENTIAL FUNDING** EDA
ECONOMIC RECOVERY GOALS Goal #1 – Respect and embrace the island's natural and cultural resources Goal #2 – Address the directly impacted area's economic recovery Goal #4 – Promote future resilience and sustainability	**TIMELINE** Near-Term **PROJECT LEAD** Environmental Management **PROJECT PARTNERS** Planning Department, Recovery Team, Water Supply

Appendix - D: Economic Development Organizations

The number of Island of Hawai‘i economic development and business support organizations and stakeholders is extensive. The following list is representative only and may not be complete:

Those that are typically led by the private sector

- Chambers of Commerce
- Business Improvement Districts
- Cooperatives
- Cultural organizations that promote or support entrepreneurs and the non-profit sector
- Development companies
- Economic development consultants
- Financial institutions
- Industry/business associations at the local or state level
- Private business centers and incubators
- Trade schools and training providers
- Social impact investors
- Minority business development organizations
- Utility companies and energy providers
- Venture capital or angel investment groups
- Statewide destination marketing organizations
- Trade development organizations

Public Sector Organizations

- County and state economic development offices
- Community development finance institutions
- Film offices
- Higher education: public universities, community colleges, and trade schools
- Redevelopment agencies
- State departments of commerce, agriculture, tourism, and labor
- Federal agencies – multiple
- Small Business Development Centers
- Workforce development boards

Small Business and Entrepreneur Support

- Small Business Development Centers, Hilo and Kailua-Kona
- The Kohala Center Rural and Cooperative Business Development Services
- HIplan
- Hawai‘i Technology Development Corporation Neighbor Island Innovation Initiative

- County of Hawai‘i Department of Research and Development’s and State of Hawai‘i’s Business Action Center
- County of Hawai‘i Department of Research and Development’s Agriculture, Creative Arts, Food Systems, Tourism, Energy, Film, and Business Development Programs
- State of Hawai‘i Department of Business, Economic Development and Tourism

Business Advocacy Membership Organizations

- Hawai‘i Farm Bureau Federation
- Hawai‘i Island Chamber of Commerce
- Hawai‘i Island Economic Development Board
- Hawai‘i Island Portuguese Chamber of Commerce
- Hawai‘i Food Manufacturers Association
- Hui ‘Oihaha – Hawai‘i Island Native Hawai’ian Chamber of Commerce
- Japanese Chamber of Commerce and Industry Hawai‘i
- Ka‘ū Chamber of Commerce
- Kona-Kohala Chamber of Commerce

Accelerators and Incubators

- Elemental Excelerator
- GoFarm Hawai‘i
- HATCH Aquaculture Technology Accelerator and Venture Fund

Professional Advisors

- Certified Public Accountants
- Attorneys
- Insurance Brokers and Agents

Industry-Specific Membership Organizations

- Big Island Association of Nurserymen
- Big Island Beekeepers Association
- Hawai‘i Cattlemen’s Council, Inc.
- Hawai‘i Export Nursery Association
- Hawai‘i Forest Industry Association
- Hawai‘i Island Contractors’ Association
- Hawai‘i Island Landscape Association
- Hawai‘i Island REALTORS
- Hawai‘i Papaya Industry Association
- Hawai‘i Tropical Flower Council
- Hawai‘i Tropical Fruit Growers
- Island of Hawaii Visitors Bureau

- Kohala Coast Resort Association
- Synergistic Hawai‘i Agriculture Council

Business Networking Membership Organizations

- Business Network International (BNI) – Hawai‘i Island Chapters

Place-Based Associations

- Hilo Downtown Improvement Association
- Honoka‘a Business Association
- Kailua Village Business Improvement District
- Kanoelehua Industrial Area Association
- Kona Coffee Growers Association
- Mainstreet Pāhoa Association
- Malama O’Puna
- Maku‘u Farmers Market
- United Ka‘ū Farmers Cooperative
- Waimea Community Association
- Waipi‘o Taro Farmers Association

Workforce Development

- Alu Like, Inc. Ho‘omānea ‘Ōiwi – Employment and Training Program
- American Job Center of Hawai‘i
- ARC of Hilo
- Goodwill Hawai’i
- Hawai‘i Community College – Hilo and Pālamanui
- Hawai‘i Community College EDvance Continuing Education
- Hawai‘i County Economic Opportunity Council
- University of Hawai‘i at Hilo
- The Daniel K. Inouye College of Pharmacy

Research Facilities

- Daniel K. Inouye U.S. Pacific Basin Agricultural Research Center (USDA)
- UH Manoa CTAHR
- Forest Service Institute of Pacific Islands Forestry (USDA)
- Hawai‘i Ocean Science and Technology Park at the Natural Energy Laboratory of Hawai‘i Authority

Funding Sources

- American Savings Bank
- Bank of Hawai‘i

- Central Pacific Bank
- Finance Factors
- First Hawaiian Bank
- Hawai‘i National Bank
- Home Street Bank
- Territorial Savings Bank
- Big Island Federal Credit Union
- CU Hawai‘i Federal Credit Union
- Hāmākua Federal Credit Union
- Hawai‘i Community Federal Credit Union
- Hawai‘i First Federal Credit Union
- HELCO Federal Credit Union
- HFS Federal Credit Union
- Onomea Federal Credit Union
- American AgCredit
- State of Hawai‘i Department of Agriculture – Agricultural Loan Division
- State of Hawai‘i DBEDT – Community Based Economic Development MicroLoans
- County of Hawai‘i Department of Research and Development Innovation Grants
- Hawai‘i Small Business Innovation Research Program
- Manufacturing Assistance Program Grant
- The Kohala Center
- HIplan Business Plan Competition
- Mahi‘ai Match-Up Agricultural Business Plan Competition
- USDA Farm Service Agency
- USDA Rural Development
- USDA Natural Resources Conservation Service

Regulatory Agencies

- County of Hawai‘i Department of Environmental Management – Solid Waste and Wastewater Divisions
- County of Hawai‘i Department of Liquor Control
- County of Hawai‘i Department of Public Works Building, Engineering, and Traffic Divisions
- County of Hawai‘i Finance Department – Business and Occupation Licensing
- County of Hawai‘i Fire Department
- County of Hawai‘i Planning Department
- County of Hawai‘i Department of Research and Development, Film Office
- County of Hawai‘i Department of Water Supply
- State of Hawai‘i Department of Commerce and Consumer Affairs Business Action Center
- State of Hawai‘i Department of Commerce and Consumer Affairs Professional and Vocational Licensing

- State of Hawai‘i Department of Agriculture – Export Inspection Program
- State of Hawai‘i Department of Agriculture – Quality Assurance Division
- State of Hawai‘i Department of Agriculture – Agricultural Development Division
- State of Hawai‘i Department of Health Sanitation Branch
- State of Hawai‘i Department of Labor and Industrial Relations Unemployment Insurance Division
- State of Hawai‘i Department of Land and Natural Resources Division of Aquatic Resources
- State of Hawai‘i Department of Land and Natural Resources Division of Boating and Ocean Recreation
- State of Hawai‘i Department of Land and Natural Resources Land Division – Commercial Activities
- State of Hawai‘i Public Utilities Commission
- State of Hawai‘i Department of Taxation
- State of Hawai‘i Department of Transportation Motor Vehicle Safety Office

Appendix - E: Incentives to Promote Economic Growth

Enterprise Zones

The Enterprise Zone program provides a combination of tax exemptions and tax credits for specific types of businesses that are based in designated Enterprise Zones. This State program is administered locally by the County Department of Research and Development.

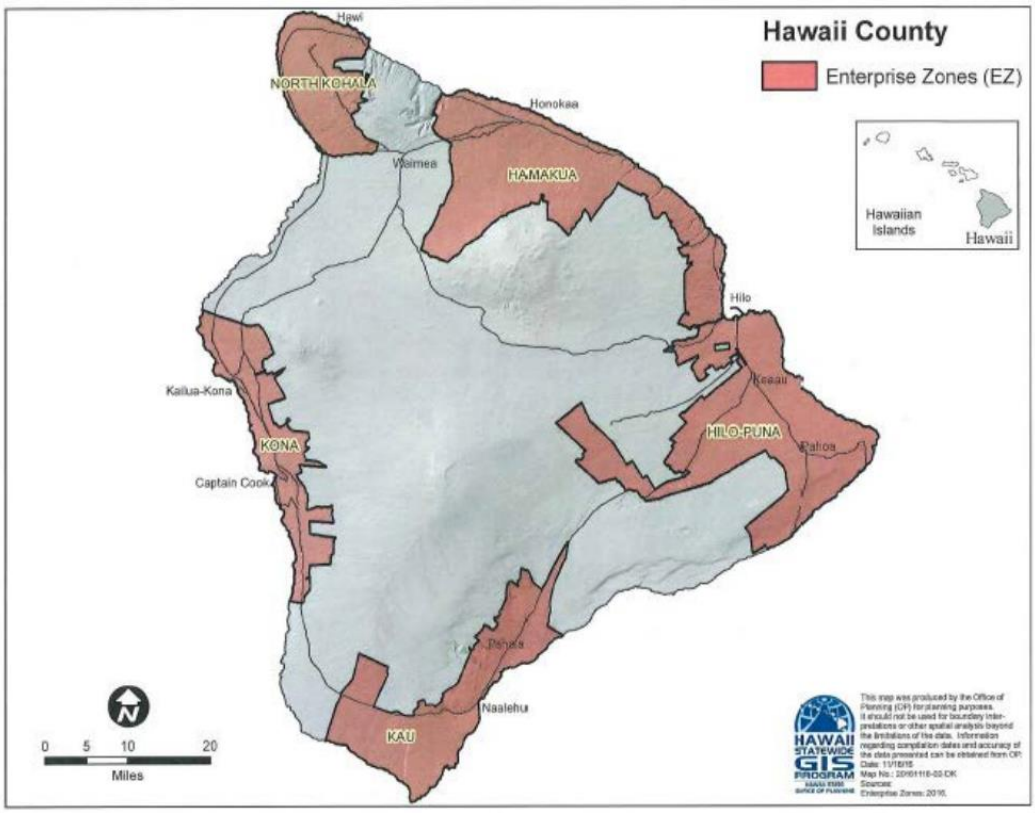


Fig. 41: Location of Enterprise Zones. (Source: DBEDT)

Foreign Trade Zones

As an economic development program to help encourage businesses engaged in international trade, the State of Hawai'i's Foreign-Trade Zone No. 9 supports businesses engaged in international trade via tariff savings programs, a bonded warehouse program, training, and on-site support services including customs brokers and shipping agents.[17] Hilo's Foreign Trade Zone site is located next to Hilo International Airport while West Hawai'i's site is located at the Natural Energy Laboratory of Hawai'i Authority next to Kona International Airport. Additionally, the program has been expanded to allow for qualifying businesses to establish the program at their respective business locations.

[17] https://www.ftz9.org/

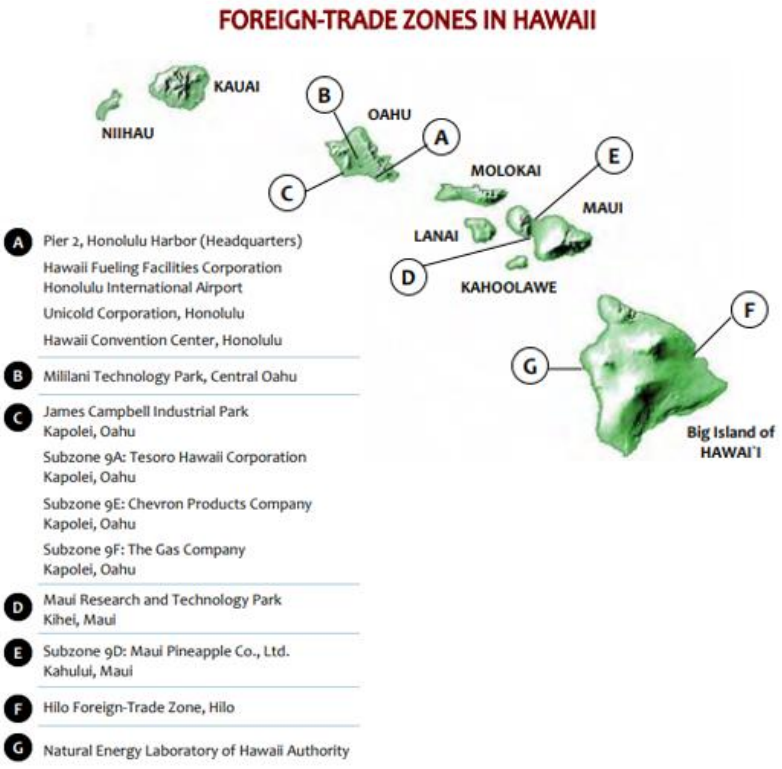


Fig. 42: Location of Foreign Trade Zones. (Source: Hawaii FTZ9 Annual Report, FY2008)

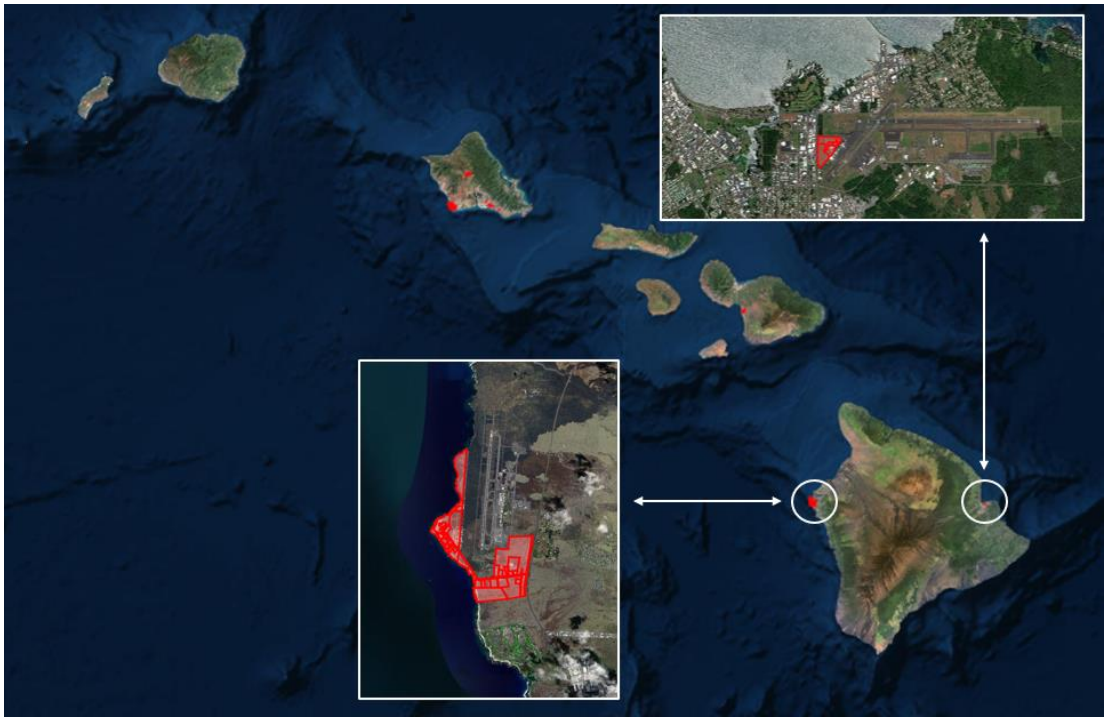


Fig. 43: Location of Foreign Trade Zones. Source: https://www.ftz9.org/about-us/ftz-locations/

Opportunity Zones[18]

In 2017, U.S. Congress signed into law the Federal Tax Cuts and Jobs Act, which authorized Opportunity Zones through December 31, 2026. The State of Hawai'i designated zones in Hilo and Kailua-Kona. The program provides incentives for investors to re-invest capital gains into Opportunity Funds in exchange for temporary tax deferral and other benefits. The Opportunity Funds are then used to provide investment capital in targeted communities. Additionally, the program overlays with other economic development initiatives such as New Market Tax Credits, Enterprise Zones and Transit Orient Development (TOD) Zones.

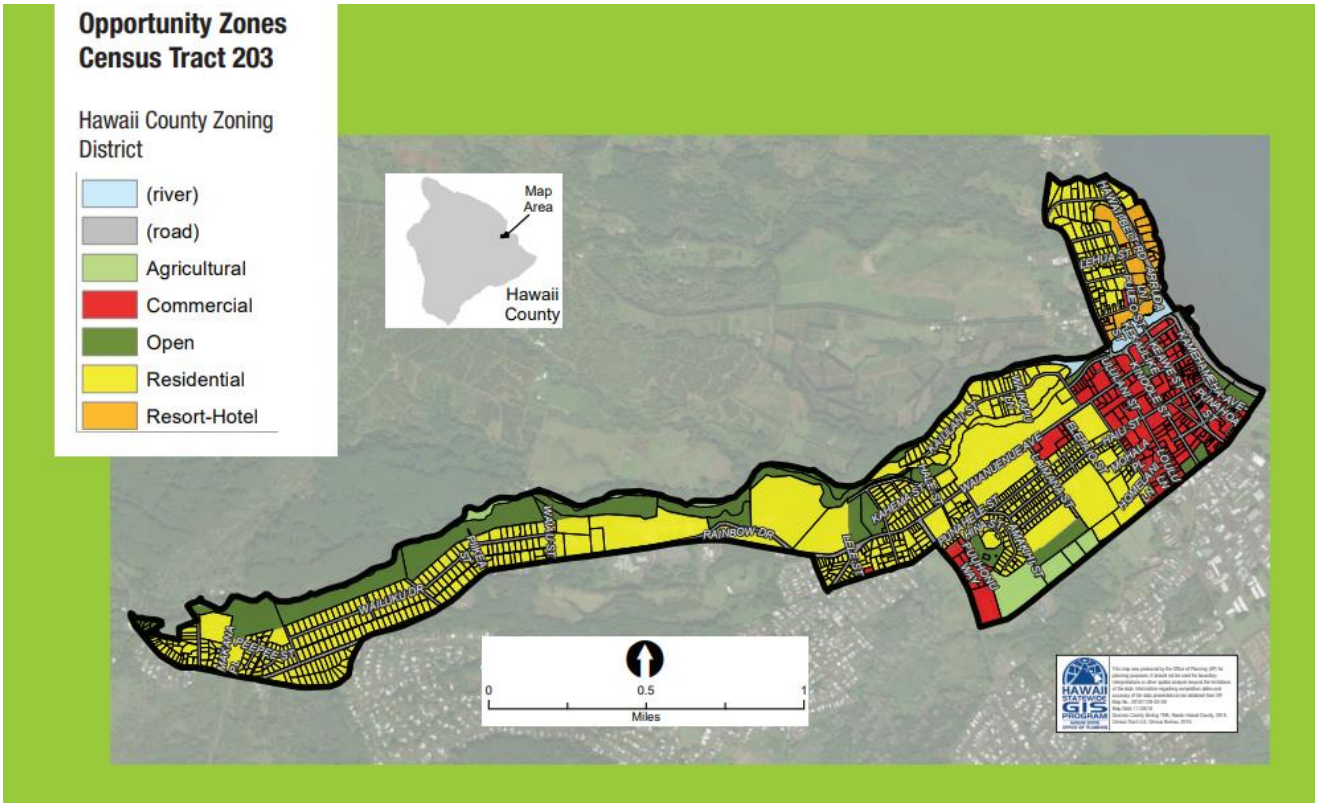


Figure 44: Hilo Opportunity Zone

Motion Picture, Digital Media, and Film Production Income Tax Credit[19]

The Island of Hawai'i offers an ideal location for film production. The State offers businesses a 25 percent refundable tax credit based on a production company's qualified expenditures while producing a film, television, commercial, or digital media projects.

[18] https://invest.hawaii.gov/oz/

[19] https://filmoffice.hawaii.gov/incentives-tax-credits/

Appendix - F: Glossary

The following glossary combines information from the International Economic Development Council (www.iedconline.org), the California Association for Local Economic Development (www.caled.org), and Hawai'ian Dictionary. Mary Kawena Pukui and Samuel H. Elbert are also sources of many of these definitions.

Ahupua'a - Hawaiian word for a land division, a section running from the mountains to the sea.

'Āina - Hawaiian word for land, the earth.

ALICE - Asset-Limited, Income Constrained, Employed individuals.

Angel Investor - individual who provides capital for business start-up, usually in exchange for convertible debt or ownership equity. Angel investors often give support to start-ups when most investors are not prepared to back them.

Assessed Valuation - the monetary worth of a property for the purposes of taxation. Total assessed valuation denotes the sum of the monetary worth of all taxable properties within a jurisdiction.

Base Industry - also known as "export" or "primary" industries, base industries sell or export their products and services outside the community and bring new dollars into the community, increasing the total dollars that circulate within the community and that are spent on non-base industries.

Benchmarking - quantifiable measures of economic competitiveness and quality of life that can be collected on a regular basis. They are used to measure a region's economic status and progress against comparable regions.

Business Attraction - efforts by local economic development organizations to encourage firms from outside their communities to locate headquarters or other operations within their jurisdictions.

Business Climate - environment of a given community that is relevant to the operation of a business; usually includes tax rates, attitudes of government toward business, and availability.

Business Improvement District (BID) - self-assessment districts that are usually initiated and governed by property or business owners, enabled by state laws, and authorized by local

government to provide public services in designated urban and suburban areas. The term is used to denote both the designated geographic areas and the organizations that manage them.

Business Incubator - entity that nurtures and supports young companies until they become viable, providing them with affordable space, technical and management support, equity and long-term debt financing, and employment. The three basic objectives in creating an incubator are (1) to spur technology-based development; (2) to diversify the local economy; and (3) to assist in community revitalization.

Business Recruitment and Attraction - traditional approach to economic development to entice companies to relocate or to set up a new branch plant or operation in a state or locality.

Business Retention and Expansion (BRE) - systematic effort designed to keep local companies satisfied and profitable at their present locations, which includes helping companies cope with changing economic conditions and internal company problems.

CDBG (Community Development Block Grants) - a system of unified block grants under which communities with more than 50,000 people are entitled to receive funding while other communities may apply for discretionary funding. Its purpose is to encourage more broadly conceived community development projects and expand housing opportunities for low- and moderate-income persons. The three primary goals of CDBG are to serve low- and moderate-income people, to eliminate slums and blight, and to address other community development needs that pose a serious and immediate threat to the health and welfare of the community. This program of the U.S. Department of Housing and Urban Development (HUD) has provided significant support for economic development projects. CDBG-DR grants are designated by HUD for disaster recovery purposes.

Clusters - co-location of firms in the same or similar industries which fosters interaction as a means of strengthening each other and enhancing the community's competitive advantage.

Comparative Advantage - term used when comparing economies of regions. It is the economic advantage gained by one area over another since it can produce a particular product more efficiently. More efficient production of one good means there is a higher opportunity cost to produce another. This is the concept that drives trade between economies. Inter-regional and international trade exploits the comparative advantages of economies.

Consolidated Plan - the Consolidated Plan, or ConPlan of a County government combines all of the planning, application, and performance requirements previously required separately for Community Development Block Grants (CDBG), HOME, Emergency Shelter Grants (ESG), Housing

for People with AIDS (HOPWA), and programs, such as HOME, that require a Comprehensive Housing Affordability Strategy (CHAS).

Economic Base - a method of classifying all productive activity into two categories: basic industries which produce and sell goods that bring in new income from outside the area, and service industries which produce and sell goods that simply circulate exiting income in the area.

Economic Base Analysis - a comprehensive study of a locality's economy, focusing on the importance of exports. It should include an economic history, data on existing industries, trends, and forecasts of growth in wages and employment.

Economic Development Administration (EDA) - a federal agency created by the Public Works and Economic Act of 1965 as a part of the U.S. Department of Commerce. The EDA's main goals are to alleviate unemployment and diversify the economy as well as assist urban areas with planning and emergency public works programs. EDA also provides certain assistance to communities that have experienced federally declared disasters.

Fiscal Impacts - the direct and indirect costs incurred, and revenues received by local governments resulting from land use and other types of decisions.

501(c)(3) - approval given by the Internal Revenue Service granting exemption from federal income tax to a nonprofit organization, under Section 501(c)(3) of the Internal Revenue Code. Donations to such organizations are tax deductible. The organizations described in 501(c) (3) are commonly referred to under the general heading "charitable organizations."

Hui - Hawaiian word for association, group, partnership.

Incentives - benefits offered to firms as part of a business attraction strategy. Incentives may include tax abatements and credits, low interest loans, infrastructure improvements, job training, and land grants. Incentives are most commonly authorized at the state level.

Industry Clusters - geographic concentrations of related businesses, either complementary or competing. Regions identify clusters as targeted businesses for future planning and marketing efforts. There are two types: (1) buyer-supplier clusters and (2) shared resources clusters.

Infrastructure Banks - public-targeted lending facilities, financed through a combination of bond issues, government funds and external donor support. They mobilize domestic funds and create an at-tractive vehicle for donor funding.

Kuleana - Hawaiian word for responsibility.

Land Banking - a program that preserves industrial space for a city. A city or local development authority acquires and holds land until a developer steps forward with a proposal for its use as an industrial site.

Mālama - Hawaiian word for "to care for", preserve, Mālama ʻāina, to care for the land.

Mana'o - Hawaiian word for knowledge, thoughts, ideas.

Multiplier - a quantitative estimate of a project's total impact (in dollars, jobs created, demand).

Multiplier Effect - the process of dollar and job generation resulting from a new or migrating business or project, or of a local business expanding production (to exports). The multiplier effect accounts for new local income generated by local spending that came from outside a community.

ʻOhana - Hawaiian word for family and extended family.

Opportunity Cost - the revenue forgone by choosing one use of money and resources over another.

Opportunity Zone - an economically distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment. Localities qualify as Opportunity Zones if they have been nominated for that designation by the state and that nomination has been certified by the Secretary of the U.S. Treasury via his delegation of authority to the Internal Revenue Service.

Pono - Hawaiian word for righteousness, upright.

Shift-Share Analysis - a method used to examine a local area's basic industries in terms of their growth and decline relative to national or regional trends.

Small Business Development Center (SBDC) - facility that provides business development, information, and assistance in one location; administered by the U.S. Small Business Administration.

Social Capital - in economic development, linkages between and among business development service providers and the companies they assist; these linkages are both internal, within a given-service provider organization, and external, between an organization (and its clients) and external service providers and businesses.

Start-Up - company in the first stage of the evolution of a business.

Start-Up Capital - funds that help nascent enterprises acquire space, equipment, supplies, and other inputs needed to launch a business.

Sustainable Development - development that does not destroy or eventually deplete a location's natural resources. Sustainable development helps ensure a better, healthier living environment and contributes to an area's quality of life, one of the primary goals of economic development.

SWOT Analysis - a tool used in the economic development planning process to assess a community's Strengths and Weaknesses, factors from within a community that can be changed, as well as its Opportunities and Threats, factors from outside that cannot be changed.

Under-employed - includes all persons whose skills, education or training qualified them for a higher skilled or better paying job than they presently hold. It also includes persons only able to find part-time rather than full-time work in their fields.

Unemployed - as defined by the U.S. Department of Labor, the term includes all civilians who were not employed, but were available and actively seeking work within the past four weeks, were waiting to be called back to a job from which they had been laid off, or were waiting to report to a new job scheduled to begin within 30 days.

Value-Added - Revenue created by the processing of resources; the amount of revenue is greater because those resources have been processed.

Venture Capital - an investment made where there is a possibility of very substantial returns on the investment, as much as 40 percent, within a short period. It is usually invested in dynamic, growing, and developing enterprises, not in start-ups.

Vog - haze containing volcanic dust and gases.

Appendix - G: References

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