

**PAUL BREWBAKER DIRECT TESTIMONY**

**PRESENTATION HEARING**

**Land Block 1, Project 6 (Mahana Ward Village) (KAK 23-027)**

**Q Please state your name, place of employment, and position.**

A Paul Brewbaker, Economist and Principal, TZ Economics.

**Q What types of services does TZ Economics provide?**

A TZ Economics is a Hawaii consultancy doing development impact analysis and other private sector economic research and analysis.

**Q Please describe your educational background and professional experience.**

A My resume is attached as an exhibit in this proceeding. My private sector background is in research on the Hawaii economy and financial risk analytics at Bank of Hawaii from 1981-2009, as a consultant and a commercial bank economist. I was also a university lecturer from 1980-2017. I am a graduate of Stanford, did graduate work at Wisconsin, and I received my PhD from the University of Hawaii, all in economics.

**Q What has your firm been retained to do for this project, Mahana Ward Village (Land Block 1, Project 6)?**

A Victoria Ward, Ltd. requested that I provide an analysis and conclusions regarding Mahana Ward Village's economic impacts and benefits in the current economic environment. My analysis and conclusions are contained in a report dated May 12, 2023, which is attached to my testimony, and summarized below.

**Q Why are Mahana Ward Village's economic contributions important?**

A Mahana Ward Village will deliver approximately 340 homes in various configurations; nearly 17,000 square feet of commercial space; nearly 48,000 square feet of outdoor and indoor recreational space; and more than 10,000 square feet of open space.

The addition of new condo units in Kaka'ako continues to be a welcome relief, especially given the continuing low inventory of housing. In addition, with Ulana Ward Village (KAK 21-001; Land Block 5, Project 2), VWL has already committed to providing all reserved housing units to satisfy the remaining reserved housing requirements for Ward Village, including the reserved housing for Mahana Ward Village, rather than in piecemeal fashion in future market rate projects. The upfront delivery of reserved housing provides significant public and economic benefits to the community,

particularly as housing demand continues to outpace supply, and current housing demand estimates underestimate true demand. In a 2019 study on housing demand in Hawai'i,<sup>1</sup> DBEDT estimated a need for at least another 25,000 housing units over the next 10 years to meet demand, and as many as 47,000, based on an assumed average of three persons occupying each housing unit.

Based on data indicating a significant increase in independent living, *i.e.*, fewer persons occupying each housing unit, I estimate that another 100,000 units are needed in addition to the nearly 50,000 units estimated by DBEDT. Over time, population lifestyle norms have shifted. In 1920, there were 5.5 people per housing unit, but by 1960 that number decreased to 3.3 people per housing unit. Today, that number is 2.9 people per housing unit.

In addition to providing additional housing units, Mahana Ward Village will materially contribute to Hawaii's Covid-19 economic recovery and sustain post-recovery growth. Hawai'i entered recovery in 2020 from the lowest position among the fifty U.S. states relative to its own peak at end-2020. In Hawai'i, labor markets remain firm with above average job openings and low unemployment and inflation having peaked at 7.5 in March 2022, but subsiding to 3.3 percent in March 2023. Hawai'i's relative economic stabilization, post-pandemic, is not a reason to inhibit private investment activity. Post-pandemic economic recovery has not been uniform (monotonic) but uneven. This underscores the significance of the economic benefits from Mahana Ward Village -- its legacy of permanent economic impacts is substantial.

In addition, there remains a need for investment in and additional funding for public infrastructure needs of the City & County of Honolulu, which needs are anticipated to increase in light of global sea rise associated with climate change, and other factors.

**Q Please describe your analysis and conclusions.**

A Beyond enhancing the lives of its residents and the Ward Village community, Mahana Ward Village will have a direct, continuing, and unbroken positive impact on the State of Hawaii and City and County of Honolulu economy. Using the State of Hawaii's input-output model,<sup>2</sup> Mahana Ward Village is estimated to generate:

- \$433.7 million in output.
- \$146.4 million in workers' earnings.

---

<sup>1</sup> <https://files.hawaii.gov/dbedt/economic/reports/housing-demand-2019.pdf>

<sup>2</sup> [https://files.hawaii.gov/dbedt/economic/reports/IO/2017\\_state\\_io\\_study.pdf](https://files.hawaii.gov/dbedt/economic/reports/IO/2017_state_io_study.pdf)

- \$26.7 million in state tax revenue (income, GET, and other).
- An annual average of 396 jobs over seven years, peaking at 707 jobs in 2027. These job numbers have been revised from the figures in the project application based on my attached report.

Over 30-year period in present values of constant 2022 dollars:

- Mahana Ward Village’s operations and maintenance will generate \$115.8 million in output, \$38.4 million in earnings, \$7.0 million in state tax revenues (income, GET, and other), and an annual average of 13 jobs. These estimates are included at p. 22 of the PDP Application for Mahana Ward Village<sup>3</sup>.
- Mahana Ward Village will accrue \$72.7 million in future county residential property tax revenues, ranging from an upper bound of \$79 million to a lower bound of \$66 million. (Report, Table 3)

Over a 50-year period in present values of constant 2022 dollars, Mahana Ward Village will accrue \$115 million in present value residential property tax revenues, ranging from an upper bound of \$125 million to a lower bound of \$105 million, based on historical volatility of home price appreciation. (Report, Table 3).

# # #

---

<sup>3</sup> Based on my attached report, the project application’s reference to the base year (2023), should be the year 2022.

## **Ward Village Block N-West Economic Impacts**

*prepared by*

Paul H. Brewbaker, Ph.D., CBE  
Principal, TZ Economics



606 Ululani St.  
Kailua, Hawaii

for

The Howard Hughes Corporation  
May 12, 2023

# Ward Village Block N-West Economic Impacts

by Paul H. Brewbaker, TZ Economics<sup>1</sup>  
May 12, 2023

## Executive summary

Ward Village Block N-West (NW) redevelopment will deliver 340 new condominium housing units in Howard Hughes' master plan for Kakaako urban renewal. This report summarizes economic impacts of Block NW redevelopment in present values of constant, 2022 dollars, and documents substantial permanent economic impacts.

- Block NW redevelopment is associated with \$434 million in direct, indirect, and induced (total) output, peaking in 2027 as construction maxes out.
- Block NW redevelopment is associated with \$146 million in total workers' earnings.
- Block NW redevelopment is associated with \$27 million in total state tax receipts.
- An annual average of 396 jobs are associated with Block NW redevelopment, with a peak annual impact of 707 jobs in 2027.
- Over thirty years beginning late in 2028, in present values of constant 2022 dollars, Block NW operations and maintenance will generate \$116 million in future output, \$38 million in earnings, \$7 million in state tax revenues, and an annual average 13 jobs.
- Over thirty years Block NW will accrue \$73 million in the present value of future real county residential property tax revenues plus or minus 9 percent, based on historical volatility of home price appreciation.
- Over fifty years Block NW will accrue \$115 million in present value real residential property taxes.

---

<sup>1</sup> This report was prepared by Paul H. Brewbaker, Ph.D., CBE, Principal, TZ Economics of Kailua, Hawaii for The Howard Hughes Corporation in a format of earlier reports related to the development's master plan and its individual towers, under planning assumptions from the developer, subject to revision.

## 1. Block NW Economic Impacts: Introduction

Block N-West redevelopment will deploy 340 new urban core condominium housing units, around average Oahu suburban single-family home prices, within the master-planned Ward Village of Honolulu’s Kakaako district.

Estimates of statewide economic impacts of Block NW development are reported here using the State of Hawaii’s latest input-output (I-O) economic model.<sup>2</sup> Through interindustry linkages final expenditure on private investment activity—capital formation—is directly associated with a variety of economic activities. Investment outlay also is associated indirectly with economic activity through derived demand for intermediate goods and services that are part of supporting production. Earnings associated with the jobs created by these activities induce personal consumption expenditures which have additional economic impacts. Quantitative estimates of direct, indirect, and induced effects comprise total economic impacts attributable to Block NW redevelopment.

Other economic consequences of Block NW redevelopment are not quantified in this report. Those excluded are certain costs of entitlement acquisition necessary for building, state conveyance taxes not itemized in the I-O model, and county property taxes paid prior to completion, as well as impacts of recent tax policy changes which may be pertinent but currently are not incorporated in the I-O model. No estimate of external social costs—unintended, uncompensated by-products of development—is included in this report although fees often are justified partly to internalize privately social costs of negative externalities. No estimate is included of social benefits of positive externalities from urban agglomeration, from economies of scale, economies of scope, neighborhood valuations, or abatement of pecuniary externalities otherwise associated with offshore demand for Oahu residential real estate assets. Fourth no estimate of the project’s contribution to conservation of natural resources is incorporated in this report.<sup>3</sup>

Economic impact estimates in this report are adjusted for 2.5 percent inflation, expressed in present values at a 3 percent discount rate from the standpoint of year 2022, taking into explicit account the impacts of the passage of time, accounting for net leakages from imported input requirements, and incorporating productivity growth in projected job impacts consistent with assumptions in the state’s I-O- model. Reporting emphasis here is on total impacts of direct and indirect effects of inter-industry linkages and induced effects of the personal consumption

---

<sup>2</sup> Research and Economics Analysis Division (READ), Hawaii Department of Business and Economic Development (DBEDT) (December 2020) *The Hawaii State Input-Output Study: 2017 Benchmark Report* ([https://files.hawaii.gov/dbedt/economic/reports/IO/2017\\_state\\_io\\_study.pdf](https://files.hawaii.gov/dbedt/economic/reports/IO/2017_state_io_study.pdf)).

<sup>3</sup> The State of Hawaii constitution directs that, “the State and its political subdivisions shall conserve and protect Hawaii’s natural beauty and all natural resources” (Article XI, Section 1), and that, “the State shall conserve and protect agricultural lands” (Article XI, Section 3). These criteria widely are interpreted and probably were intended to favor urban density in residential development over suburbanization of agricultural land. (The Rural District does not exist on Oahu in Hawaii’s Land Use Law.) Ward Village contributes to this mandate through concentration of residential development in Honolulu’s urban core. See League of Women Voters of Honolulu (<https://www.lwv-hawaii.com/govt/constitution/art11.htm>).

expenditure effects of higher earnings from associated job creation. Output here comprises total value inclusive of intermediate goods and services, a broader measure than value-added (GDP).

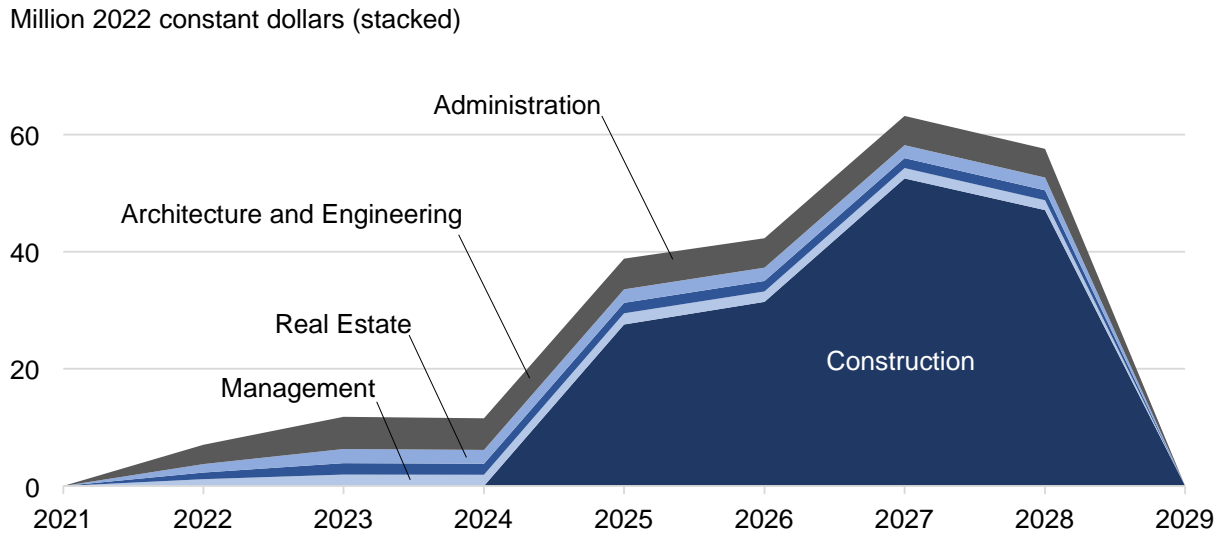
## **2. Development and construction economic impact estimates**

Ward Village Block NW development and construction economic impacts in 2022 dollars, over eight years 2021-2028, predominantly later during the 2020s as the associated construction impulse reaches its zenith, all in present value terms, are as follows.

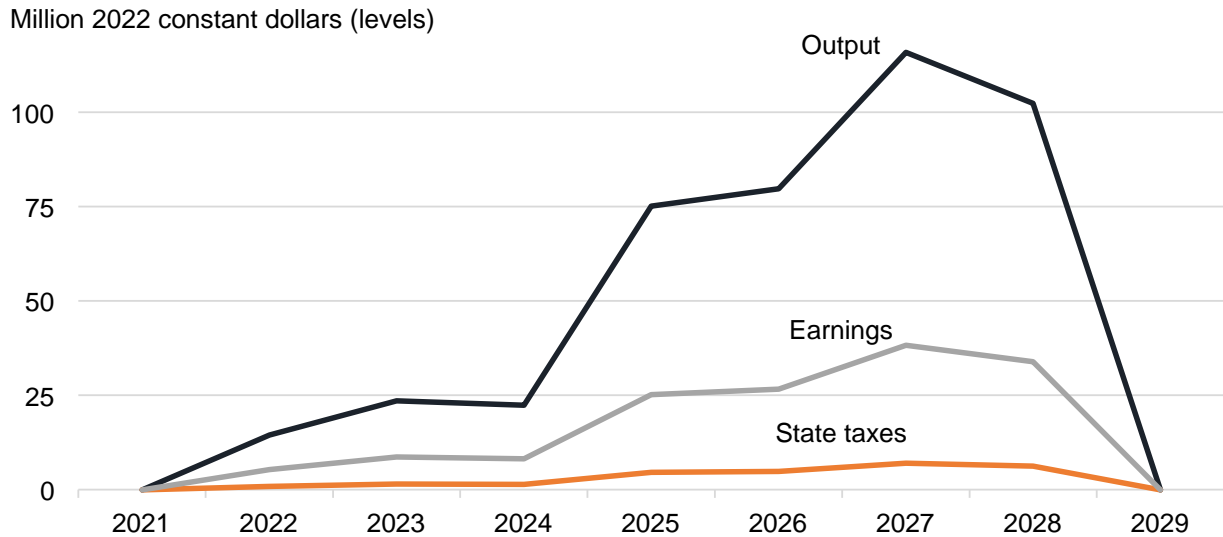
- Block NW development and construction is associated with \$295 million in direct and indirect impacts on output from interindustry consequences of development, construction and marketing and other management and administrative activities. Including the expenditures arising from the incomes created directly and indirectly with the project, Block NW is associated with \$434 million in direct, indirect, and induced (total) output.
- Block NW development and construction is associated with \$109 million in workers earnings directly and indirectly, and is associated with \$146 million in direct, indirect, and induced (total) earnings.
- Block NW development and construction is associated with nearly \$20 million in state taxes directly and indirectly, and is associated with nearly \$27 million in direct, indirect, and induced (total) state tax receipts.
- An annual average of 274 jobs are associated directly and indirectly with Block NW development and construction (one job-year or one job for one year), and with 396 jobs including the full scope of total effects (direct, indirect, and induced) over eight years, with a peak annual count of 707 jobs—both on the project and as its economy-wide consequence—in 2027 at the height of construction.

Following a multi-year period of planning and development, the economic impulse of Block NW development surges from 2026-2028 in the construction phase of the project before impacts subside upon completion later in 2028. These contemporaneous economic impacts are illustrated in Figures 1, 2(a) and 2(b), below, and are summarized in Table 1.

**Figure 1.** Block NW development outlay attributions (million 2022\$, in present values)



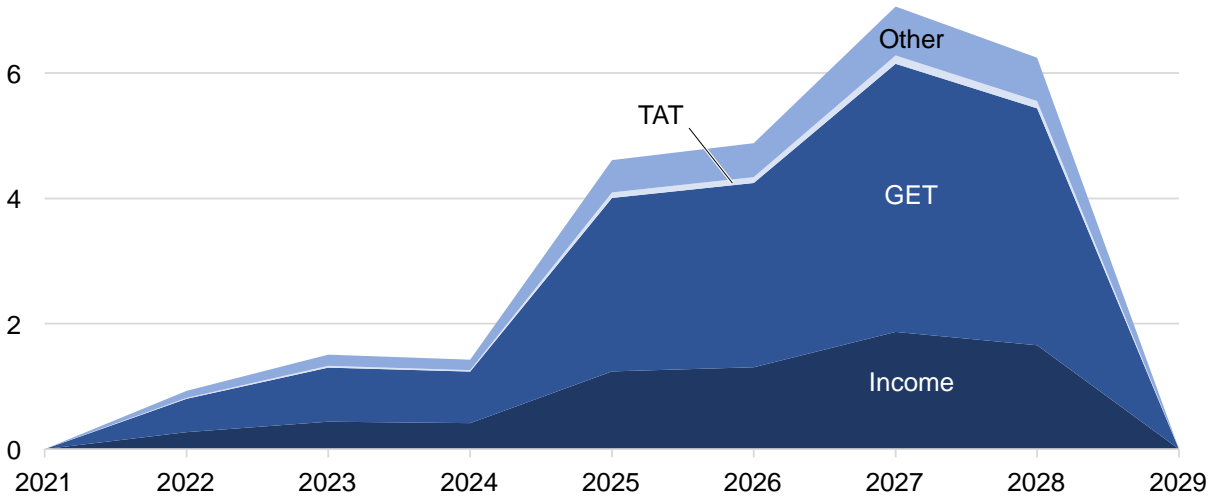
**Figure 2(a).** Block NW economic impacts (million 2022\$, in present values)





**Figure 2(b).** Block NW state tax revenue impacts (million 2022\$, in present values)

Million 2022 constant dollars (stacked)



**Table 1.** Estimated economic impacts of Block NW

**BLOCK NW DEVELOPMENT AND CONSTRUCTION IMPACTS**

Million dollars of present value, or as noted		
	Direct + indirect impacts	Total impacts
Output	\$ 327.3	\$ 481.1
Earnings	\$ 121.2	\$ 162.2
State tax*	\$ 22.1	\$ 29.6
Average annual jobs	274	396
Million constant (2022) dollars of present value, or as noted		
	Direct + indirect impacts	Total impacts
Output	\$ 294.9	\$ 433.7
Earnings	\$ 109.4	\$ 146.4
State taxes	\$ 19.9	\$ 26.7
Average annual jobs	274	396
Peak annual jobs (2027)	478	707
*Aggregated income, excise, and other state tax revenue impacts		
Development and construction outlay by economic activity		
Million dollars		
	Planned	Import-adjusted
Construction	\$ 318.5	178.4
Architecture, engineering	\$ 16.4	13.2
Real estate	\$ 14.1	12.9
Management	\$ 19.5	16.4
Administrative (other indirect costs)	\$ 43.7	37.0
<b>Total</b>	<b>\$ 412.2</b>	<b>257.9</b>

### 3. Permanent, ongoing economic impact estimates

Upon completion, the condominium tower, grounds, and related amenities in Block NW require ongoing operations and maintenance of common areas and infrastructure, such as elevators and recreational spaces. These needs require annual collective outlays. Because they are aggregated and managed under homeowner association, they collectively comprise an independent, material economic consequence of the development

Permanent and ongoing Block NW economic impacts in 2022 dollars are reported below. Permanent operations and maintenance outlays required to secure the building's longevity are associated through interindustry linkages with economic activity and related employment, incomes, and tax receipts. Like development, construction, and marketing activities arising from building the condominium, economic activities associated with its operations and maintenance give rise to imported goods and services which are excluded from onshore economic impact calculations.

Impacts of labor-saving productivity growth on employment over time are incorporated in the job impact calculations from permanent, ongoing activities, just as they are for contemporaneous development and construction. What happens over several years of construction, while incorporated in the impact estimates, is less noticeable than what happens over several decades of maintenance. Job creation erodes over time as productivity increases and cumulatively is larger over longer sweeps of time. Upon initiation of the first full year of operations and maintenance in 2029, for example, 18.3 jobs are associated with Block NW, but after thirty years of productivity growth, the associated count is 8.9 jobs based on calibrations implicit in the state's input-output model. This summary reports the average job impact for the entirety of the 30 years. The state's published estimates of job multipliers for this sector, 2021-2028, based on the 2017 Hawaii Census of Industry, are extended to 2058 and beyond using a log-linear regression model which embodies parameterization implicit in the published calibrations.<sup>4</sup>

As a result:

- Block NW will be associated over thirty years beginning in 2028 with operations and maintenance outlays generating \$116 million in the present value of constant, 2022-dollar future economic output, \$38 million in the present value of future earnings, \$7 million in the present value of future state tax revenues, and an annual average 13 jobs with productivity growth, including direct, indirect, and induced economic effects,

as summarized in Table 2.

---

<sup>4</sup> Because published estimates are available, 2018-2026, the impact estimates reported here stipulate to the officially published job multipliers for those years. To extend the multipliers, the natural logarithms of published multipliers are regressed on a time index, and then projected for the subsequent three decades. For repair and maintenance activities, this method estimated a 3.45 percent annual reduction in Type 2 job multipliers, each year.

**Table 2.** Continuing Block NW economic impacts

<b>BLOCK NW PERMANENT ONGOING MACROECONOMIC IMPACTS</b>		
Million constant (2022) dollars or as noted		
Present value of operations, maintenance over 30 years @3%		
Direct, indirect, and induced		
Output	\$	<b>115.8</b>
Earnings	\$	<b>38.4</b>
State taxes	\$	<b>7.0</b>
Jobs (average number)		<b>13</b>

#### 4. Real property tax revenue estimates

Block NW generates real property tax revenues for the City & County of Honolulu. Estimates of their present value, in constant 2022 dollars, over a 30-year and a 50-year horizon are calculated under current (2022) tax law. The baseline around which upper and lower bound estimates of future home price appreciation paths are used to calculate alternative property tax revenues assumes that Oahu existing homes appreciates at an annual rate of 4 percent over time.<sup>5</sup> Other assumptions are designed to be conservative calibrations. Ownership patterns are adopted consistent with the mauka character of Block NW and a spatial valuation gradient extending mauka from Ala Moana Boulevard, calibrated to prior Ward Village experience.<sup>6</sup>

<sup>5</sup> Under current tax law, assuming that old-age deductions are not pertinent, a homeowner’s deduction of \$100,000 from assessed value is included in the tax base. An effective residential tax rate of 0.0035 is applied to assessed value after the homeowner deduction, where appropriate. For investor-owned and second homes the first \$1 million in assessed value is taxed at a rate of 0.0045 (the so-called Tier 1 rate), or \$4.50 for each \$1,000 of assessed value. Amounts of assessed value above the first \$1 million are taxed at a rate of 0.0105 (Tier 2). Based on historical evidence summarized in the appendixes, incorporating the decline in background inflation during the forty years summarized by the median existing home price data upon which this benchmark calculation is based, price appreciation at the low end of the observed historical range of 4-5 percent annual appreciation rate is assumed to continue to raise assessed valuations over time, accordingly. From appreciated future values 2 percent inflation is removed each year, and then future values after inflation are discounted to a 2021 present value at a discount rate of 3 percent. Some issues regarding calibration of this discount rate also are discussed briefly in the appendixes.

<sup>6</sup> Calibrated to neighboring properties, the proportion of Block NW units assumed to be held by owner-occupants is 36.9 percent of the building total. Proportions comprising units held as investments (31.7 percent), and as second homes (31.4 percent) are distinguished accordingly and by property tax rates (footnote 5).

Over thirty years the contribution of Block NW to City & County of Honolulu real property tax revenues is substantial, in constant-dollar terms and present values. Given Hawaii jurisdictions' high bond ratings and relatively generous borrowing capacity extant, compared to the relevant legal borrowing constraints, the present values of *incremental* county property tax revenue are further accretive to the county's borrowing capacity.<sup>7</sup> As discussed further in the appendix, the term structure of risk-free interest rates proxied by constant-maturity yields on U.S. Treasury securities, and projections of monetary policy by the Federal Reserve Board discussed in the appendix, are consistent with an expectation that these borrowing costs are going to continue settling, with monetary policy tightening concluding, from 2023 through mid-decade.<sup>8</sup> A return to neutral funding costs, settling inflation risk premia, and well-rated municipal borrowing capacity will be complemented by addition of incipient future property tax receipts arising from Block NW redevelopment.

Hypothetically, a private development of a new residential condominium tower worth \$73 million in the present value over thirty years of future property tax receipts, reserving 20 percent of that value to be conservative (as an "equity" tranche), adds \$58 million in incremental borrowing capacity *today* for future long-term infrastructure investments by the city. Whether or not this 20 percent "haircut" is considered, hypothetical future property tax revenues augment the asset side of the jurisdiction's balance sheet, against which liabilities incurred even when the infrastructure investments funded by such borrowing are not revenue-generating. (Indeed, the \$73 million in present value in this example equally would be available to offset \$73 million in the present value of future current as well as capital expenditures.)

The hypothetical \$73 million in this example is essentially bankable for the jurisdiction, and the infrastructure investments enabled by present values of incremental property tax receipts *are accretive to the productive capacity* of the economy. This also augments the jurisdiction's ability to pay. By raising productivity, infrastructure investments contribute to the tax base even when such investments are not revenue-generating *per se*. At a time when global sea rise associated with climate change is rapidly become a significant, and coastal roadway alignments imminent, compelling future public infrastructure needs of the City & County of Honolulu cry out for additional funding. A county jurisdiction's capital formation funding options are not limited to fiscal largesse of state or federal governments when private investments in real property tax-generating assets also are available. Block NW redevelopment literally represents, in present value terms, a standing harvest of assets' returns.

Block NW redevelopment is *securitizable*: its existence provides a basis for borrowing secured by repayment and public debt-servicing even when public investments themselves do not generate revenue streams. When fulfilling social needs is a primary objective, a jurisdiction benefits from the incremental present value of future property tax receipts generated by urban redevelopment.

---

<sup>7</sup> These attributes were sourced from local municipal bond fund managers.

<sup>8</sup> This is detailed in the appendix, but the yield on 10-year U.S. Treasury Notes in May 2021 was approximately 3.35 percent (<https://www.federalreserve.gov/releases/h15/>), about 200 basis points (2 percentage points) higher than two years earlier, before monetary policy tightening. The median forecast of participants of the Federal Reserve Board's Federal Open Market Committee March 2023 meeting was a longer-run neutral interest rate of about 2.50 percent (<https://www.federalreserve.gov/monetarypolicy/fomcprojtab120230322.htm>).

Over thirty years real property tax revenues of Block NW redevelopment are estimated below.

- Block NW will be associated over thirty years beginning in 2028 with \$73 million in the present value of future county residential property tax revenues under the baseline assumption grounded in historical housing appreciation rates.
- Because of the exportability of the City's Residential A property tax rates (footnote 5 ), approximately 80 percent of the baseline property tax revenue will arise from second-home and other investors, and about 20 percent from owner-occupants.
- A lower bound estimate of the present value of real property tax revenues from Block NW over thirty years beginning in 2028 is \$66 million; an upper bound estimate is \$79 million, based on the historical volatility of home price appreciation over time.

Over fifty years the present values of future Block NW property tax receipts are higher.

- Block NW will be associated over 50 years beginning in 2028 with \$115 million in the present value of future county residential property tax revenues.
- A lower bound estimate of the present value of real property tax revenues from Block NW over 50 years beginning in 2028 is \$105 million; an upper bound estimate is \$125 million.

The Block NW real property tax estimates' attributions under thirty- and fifty-year time horizons are summarized in Table 3, below.

**Table 3:** Present value of future Block NW real property tax receipts

Estimated central tendencies and upper and lower bounds based on a 4 percent nominal appreciation rate plus or minus conditional standard deviations (95% confidence interval)

<i>in million 2021 dollars</i>	Non-owner occupant	Owner- occupant	Total
<b>Present value over 30 years</b>	\$57.9	\$14.8	<b>\$72.7</b>
Upper bound	\$63.5	\$15.9	\$79.4
Lower bound	\$52.3	\$13.7	\$66.0
<b>Present value over 50 years</b>	\$92.7	\$22.6	<b>\$115.3</b>
Upper bound	\$101.1	\$24.3	\$125.4
Lower bound	\$84.2	\$21.0	\$105.1

## 5. Dynamic economic impacts

Development and construction, investment generally, are distinguished from consumption activity by the fact that their economic impacts accrue over time. There are exceptions: consumer durables purchase of computers or motor vehicles give rise to consumption over time even when economic impacts (sales) are measured at a point in time. Long lives of buildings make their building (the verb) different from consumption in that the creation of the productive capacity—production of housing services—generates economic impacts over years or decades, generally exceeding the lifetimes of benefits from most consumer durables. This report explicitly incorporates the role of time, both in the *flow* of capital formation associated with development and construction, as well accruing to the *stock* of capital upon completion of the investment activity. The latter has been the focus of real property tax impact estimates, and economic impacts of operations and maintenance, in previous sections of this report.

This section details the annual flow of investment outlays and the timing of associated economic impacts during development and construction of Block NW. Delivery of individual Ward Village block redevelopments has been staggered over time. Each one is associated with a crescendo and impulse of development and related administrative and management activities culminating with construction. The flow of investment outlay concludes upon the building’s delivery. Because time is of explicit importance in physical capital formation, economic impact estimates have been discounted to present values in the year 2022. The effects of inflation also have adjusted to originate in that that reference point, 2022, with a slightly higher longer term inflation assumption of 2.5 percent, versus 2.0 percent in the Urban Hawaii consumer price index during the 2010s. Annual economic impacts of Block NW redevelopment are detailed over time in Table 4, below, consistent with the summary impacts in preceding tables.

**Table 4: Annual Block NW economic impacts**

<b>Block NW development impacts (million 2022\$ in present values,* job-years<sup>†</sup>, or as noted)</b>										
<b>Direct and indirect</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>TOTAL</b>
Output (mil 2022\$)	0.0	9.5	15.4	14.6	51.2	54.4	79.6	70.3	0.0	294.9
Earnings (mil 2022\$)	0.0	4.0	6.5	6.2	18.9	19.9	28.6	25.3	0.0	109.4
State taxes (mil 2022\$)	0.0	0.7	1.1	1.1	3.5	3.7	5.3	4.7	0.0	19.9
Jobs (average number)	0.0	81	135	131	315	337	478	440	0.0	274
<b>Direct, indirect, and induced</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>TOTAL</b>
Output (mil 2022\$)	0.0	14.5	23.6	22.4	75.2	79.7	115.9	102.4	0.0	433.7
Earnings (mil 2022\$)	0.0	5.3	8.7	8.2	25.2	26.7	38.3	33.9	0.0	146.4
State taxes (mil 2022\$)	0.0	0.9	1.5	1.4	4.6	4.9	7.1	6.2	0.0	26.7
Jobs (average number)	0.0	108	180	176	457	492	707	653	0.0	396
<b>Block NW state tax revenue impacts (million 2022\$ in present values*)</b>										
<b>Direct and indirect</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>TOTAL</b>
Individual income (mil 2022\$)	0.000	0.202	0.328	0.311	0.919	0.969	1.385	1.226	0.000	5.339
GET (mil 2022\$)	0.000	0.403	0.654	0.621	2.161	2.296	3.352	2.960	0.000	12.448
TAT (mil 2022\$)	0.000	0.008	0.013	0.013	0.048	0.051	0.075	0.066	0.000	0.275
Other (mil 2022\$)	0.000	0.068	0.111	0.105	0.322	0.340	0.489	0.433	0.000	1.869
Annual total	0.000	0.681	1.106	1.051	3.450	3.656	5.301	4.686	0.000	19.931
<b>Direct, indirect, and induced</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>TOTAL</b>
Individual income (mil 2022\$)	0.000	0.270	0.438	0.416	1.239	1.307	1.871	1.657	0.000	7.197
GET (mil 2022\$)	0.000	0.532	0.864	0.820	2.771	2.940	4.277	3.779	0.000	15.983
TAT (mil 2022\$)	0.000	0.016	0.026	0.025	0.086	0.091	0.133	0.117	0.000	0.495
Other (mil 2022\$)	0.000	0.109	0.177	0.169	0.516	0.545	0.782	0.692	0.000	2.990
Annual total	0.000	0.927	1.505	1.430	4.611	4.883	7.063	6.245	0.000	26.664
<b>Block NW development outlays by econ. activity, adjusted for imports (mil. 2022\$ in present values*)</b>										
<b>Outlays (mil. 2022\$)</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>TOTAL</b>
Construction	0.0	0.0	0.0	0.0	27.6	31.4	52.5	47.1	0.0	158.6
Architecture, engineering	0.0	1.2	1.9	1.9	1.9	1.8	1.8	1.7	0.0	12.2
Real estate	0.0	1.1	1.9	1.9	1.8	1.8	1.7	1.7	0.0	12.0
Management	0.0	1.4	2.4	2.4	2.3	2.2	2.2	2.1	0.0	15.1
Administrative (indirect)	0.0	3.3	5.5	5.4	5.2	5.1	5.0	4.9	0.0	34.3
Annual total	0.0	7.0	11.8	11.5	38.8	42.3	63.2	57.5	0.0	232.1

\*Assumes 2.5% CPI inflation, 3% (risk-free) discount rate, and trend productivity growth

<sup>†</sup>One job for one year; average annual labor requirement reductions from productivity growth 3% (s.d. 0.6-0.8 percentage points)



## 6. Discussion

Input-output models are linear by design. Changes in demand for interindustry goods and services translate directly into employment and output effects mechanically, without changes to factor prices for labor and materials. The resulting multipliers underlying the economic impacts of Block NW redevelopment which have been estimated here imply that resources are adequate to enable production activities to engage according to the pattern of development investment outlays. In a full-employment context in which skilled labor may be scarce or sourcing non-labor inputs is confounded by logistics and supply-chain disruptions, it is possible that an increase in investment demand could warrant an alternative estimating approach in which input prices *and* output prices are flexible, not fixed as linear production modeling implies. Some of the developer's increased demand for certain inputs such as steel or concrete are sourced from outside the Hawaii economy, but a single developer's demand is unlikely to affect input prices for an entire input market. Increased demand by the developer for other inputs, for example skilled labor in some tasks or occupations, *could* have an impact on wage rates in a labor market defined over a smaller geography. In adopting the State of Hawaii's input-output model for economic impact estimation, we have implicitly assumed that these price effects, if they exist at all, are muted and that the individual developer's decisions do not have economy-wide impacts on prices. This is a reasonable approach, and the standard assumption.

Also, post-pandemic economic recovery in 2021-2022 was complicated by supply chain disruptions which raised producer prices of building materials and of other inputs. About half of the inflation surge in 2021-2022 can be attributed to such supply side influences.<sup>9</sup> Transitory supply-side inflation was compounded in 2022 by Russian invasion of Ukraine and consequent sanctions, and their specific effects on global petroleum and grain markets. Hawaii inflation peaked in March 2022, however, and disinflation through 2025 will return inflation to the Federal Reserve's policy goal by or before mid-decade, responding to recent monetary policy tightening.

At the time this Block NW economic impact analysis was written,<sup>10</sup> three years after the 2020 COVID-19 recession, with widespread talk of another recession but certainly a softer landing

---

<sup>9</sup> A 60:40 ratio between demand-side inflation factors and supply-side inflation factors, or the other way around, appears in much recent literature estimating relative roles of post-pandemic factors, supporting a "fifty-fifty" compromise. The Fed's monetary policy response (higher interest rates) primarily influences demand-side factors while post-pandemic supply chain re-articulation cannot diminish geopolitical supply-side inflation factors (such as wars and associated commodity market dislocations). See Şebnem Kalemli-Özcan, Julian di Giovanni, Álvaro Silva, and Muhammed Yıldırım (June 2022) "Global Supply Chain Pressures, International Trade, and Inflation" presented at the ECB Forum on Central Banking, Challenges for monetary policy in a rapidly changing world, ([https://www.ecb.europa.eu/pub/conferences/ecbforum/shared/pdf/2022/Kalemli-Oezcan\\_paper.pdf](https://www.ecb.europa.eu/pub/conferences/ecbforum/shared/pdf/2022/Kalemli-Oezcan_paper.pdf)). U.S. empirical estimates also around 50-50 include: Adam Hale Shapiro (June 2022) "A Simple Framework to Monitor Inflation" *FRBSF Working Papers 2020-29* (<https://www.frbsf.org/economic-research/publications/working-papers/2020/29/>).

<sup>10</sup> National Bureau of Economic Research (<https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions>) and *Business Cycle Dating Committee Announcement July 19, 2021: Determination of the April 2020 Trough in US Economic Activity* (<https://www.nber.org/news/business-cycle-dating-committee-announcement-july-19-2021>).

than in 2020, Hawaii labor markets have remained firm with above average job openings and low unemployment, Urban Hawaii inflation having peaked at 7.5 percent in March 2022 but subsiding to 3.3 percent by March 2023, and a sharp drop in housing market activity because of the jump to high but now subsiding interest rates. Macroeconomic details are included in the appendices.

A recession for Hawaii in 2023 is *still* on people's minds after two years of false predictions, but the fact of Hawaii economic stabilization, post-pandemic, is not a reason for inhibiting private investment activity. The benefits to the community of Block NW redevelopment remain compelling, as always, for two reasons.

First, economic recovery may suffer if the weight of higher interest rates does produce *nationwide* recession. A recession for the U.S. (which hasn't happened in two years, even with two consecutive quarters of negative real GDP growth to open 2021) still could dampen Hawaii economic prospects by weakening travel demand. Even if Hawaii itself would not experience a regional recession, a drop in mainland tourism would push in that direction.

Second, Block NW redevelopment makes a significant, incremental to housing capacity on Oahu as part of longer-term master plan fulfillment providing thousands of new housing units. At Honolulu homebuilding rates of the last decade, even 242 new units in Block NW redevelopment constitutes more than 10 percent of annual average Oahu homebuilding. Block NW redevelopment makes a material contribution to housing need.

## **Conclusion**

Ward Village Block NW development and construction of 340 new condominium housing units continues Howard Hughes' master plan for Kakaako urban renewal. This report has summarized economic impacts of Block NW redevelopment in present values of constant, 2022 dollars. Block NW's initial development phase will transition to a construction phase from 2026-2027 with peak impacts in 2026. Its legacy of permanent economic impacts is substantial.

- Block NW development and construction is associated with \$295 million in direct and indirect impacts on output, and with \$434 million in direct, indirect, and induced output.
- Block NW development and construction is associated with \$109 million in earnings directly and indirectly, and \$146 million in direct, indirect, and induced earnings.
- Block NW development and construction is associated with \$20 million directly and indirectly, and with \$27 million in direct, indirect, and induced state tax receipts.

- An annual average of 274 jobs directly and indirectly, and 396 jobs including direct, indirect, and induced effects, are associated with Block NW development and construction, with a peak annual count of 707 jobs in 2027.

Permanent, ongoing economic impacts of Block NW redevelopment accrue from operations and maintenance outlays as well as real property tax revenues accruing to the City & County of Honolulu. Adjusted for inflation, some of their constant-dollar approximate values range from nearly \$116 million in real output effects of operations and maintenance over thirty years, to \$115 million in property tax receipts over fifty years.

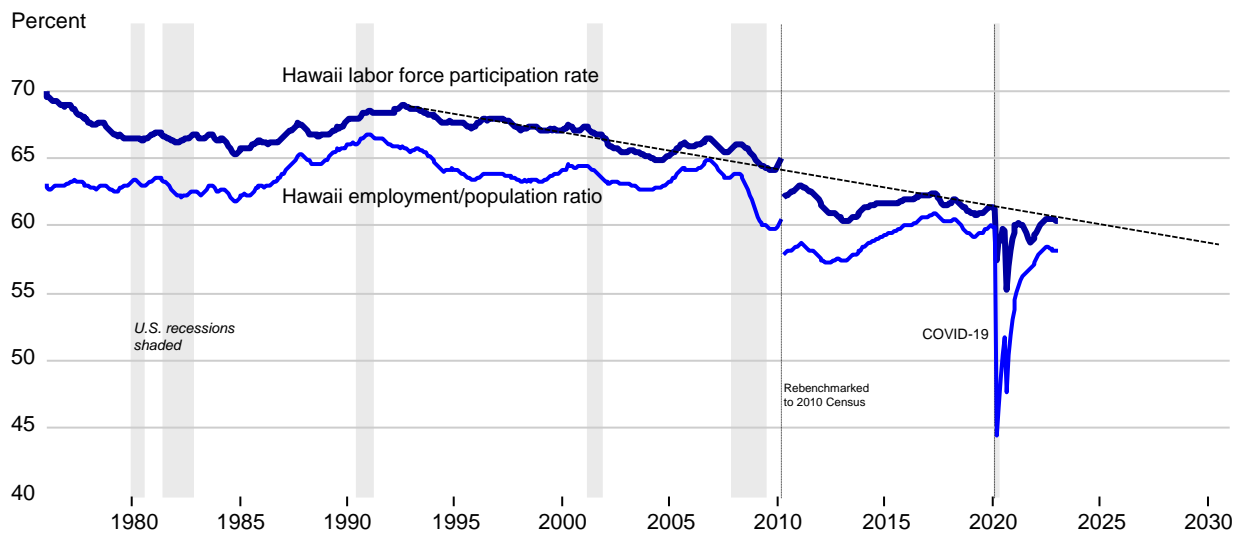
- Over thirty years beginning in 2028, Block NW will be associated with operations and maintenance outlays generating \$116 million in the present value of constant-dollar future economic output, \$38 million in the present value of future earnings, \$7 million in the present value of future state tax revenues, and an annual average 13 jobs after productivity growth, including direct, indirect, and induced economic effects
- Block NW will be associated over thirty years beginning in 2028 with a baseline estimate of \$73 million in the present value of future county residential property tax revenues. Exportability of the Residential A property tax rate implies an 80:20 split between property tax revenue from second-home and other investors, and from owner-occupants.
- An upper bound estimate of the present value of real property tax revenues from Block NW over thirty years beginning in 2028 is \$79 million; a lower bound estimate is \$66 million, based on the historical volatility of home price appreciation over time.
- Block NW will be associated over fifty years beginning in 2028 with \$115 million in the present value of future county residential property tax revenues.
- Accounting for volatility, an upper bound estimate of the present value of real property tax revenues from Block NW over fifty years beginning in 2028 is \$125 million; a lower bound estimate is \$105 million.

Block NW redevelopment supports area amenities as well as public open space development commitments in addition to a large number of new urban residential condominium units at average prices of suburban residential detached units. Block NW redevelopment makes a substantial contribution through the stimulus of private capital outlays to sustaining economic recovery from the 2020 pandemic recession and economic expansion in the mid-2020s. Block NW's permanent economic legacy includes a substantial and bankable addition to the present value of the city's future property tax receipts and to ongoing economic activity arising from building operations and maintenance.

## Appendix. Economic recovery characteristics

- Falling labor force participation trend.** Labor force participation in Hawaii peaked in the 1970s at about 70 percent of the workforce, during an early-statehood, three decade-long transition to higher female labor force participation from as low as 40 percent in Hawaii’s post-war, late-territorial era workforce. Decreasing fertility beginning in the mid-20<sup>th</sup> century followed decreased infant mortality in the early-20<sup>th</sup> century which increased survivorship and the need for additional child “insurance.” Labor-saving changes in household technology reduced child labor in the home and freed up time for investments in human capital through education and increasingly affordable air travel. As birth rates fell, increased longevity from better health care systems further help raise proportions of Hawaii’s older population relative to its younger population. By 1980, the labor supply impulse from Baby Boomer workforce entry was subsiding. By 1990, male and female labor force participation in Hawaii essentially were equal after adjusting for leave from work for birthing and early childhood parenting. After the 1980s, these cumulative factors—especially aging—eroded Hawaii labor force participation on trend from 69.2 percent of the workforce in 1976 to 60.6 percent in 2022.

**Figure A-1.** Labor force participation in Hawaii  
Returning to longer-term (demographic) declining trend, post-pandemic



Source: U.S. Bureau of Labor Statistics (<https://data.bls.gov/PDQWeb/ln>), updated to March 2023.

Average age in Hawaii's population increased after the 20th century demographic transition (death rates falling before birth rates) and from increased longevity. Both provided additional earning years, compounding wealth accumulation which, combined with social insurance, reduced older individuals' need to work. Following pandemic decline, the completed, V-shaped post-pandemic rebound returned Hawaii labor force participation to its pre-pandemic (declining) trend, 60.6 percent in early 2023 which, adjusted for trend, would be the about the same as 60.9 percent in 2019.<sup>11</sup> Participation will continue declining for years as aging plays out, but also because wealth accumulation over time has shifted the work-leisure tradeoff and created an investor cohort which—demographically—was less significant or non-existent, one-half century ago or one century ago. In 1920, there were 33 working-age persons for each person 65 and older, and 60 percent of Hawaii's workforce was in agriculture. In 2020, there were 3 working age persons for each person 65 and older, and 0.6 percent of Hawaii's workforce was in agriculture. The shape of the population, the economy, and the workforce have changed. Combined with productivity growth, this created a foundation for high-end residential real estate investment that never existed in Hawaii before.

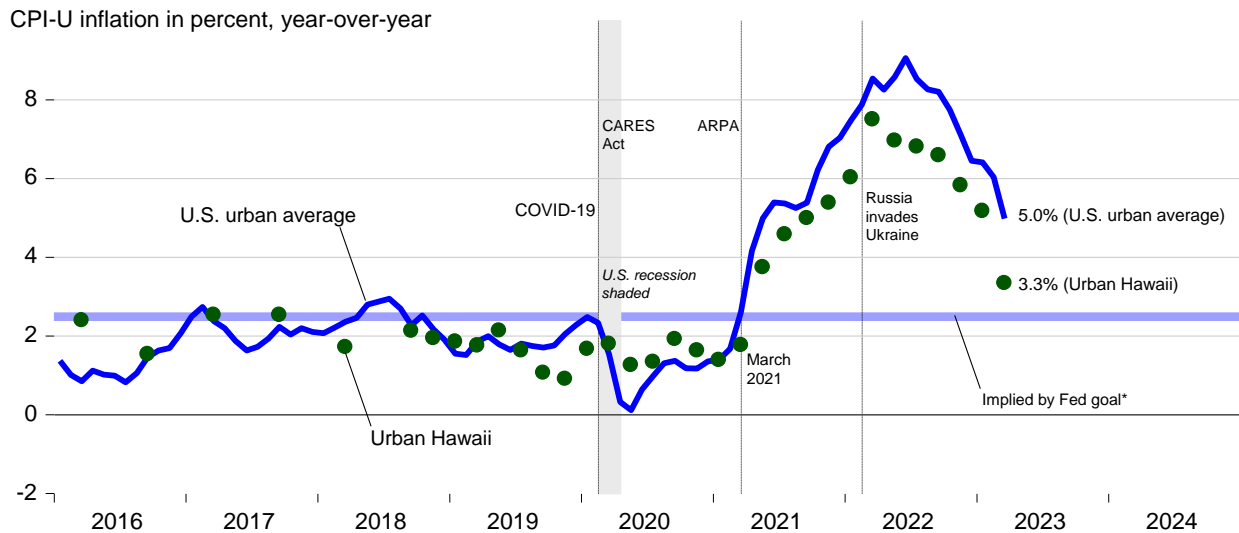
2. **Transitory inflation impulse.** Among outcomes of the global 2020 covid pandemic was a transitory inflation spike in 2021. After widespread covid vaccination, economic recovery around the world remained disarticulated, with regions at *different* stages of biological and economic recovery. Discontinuous supply chains had to be rebuilt following 2020 shutdowns. Recovering demand outstripped supply in many materials. Prices rose to equilibrate markets. Strong household demand followed \$5 trillion in U.S. federal fiscal stimulus (as elsewhere internationally) combined with low interest rates from accommodative monetary policy. A recovering labor markets tightened quickly. A switch to restrictive monetary policy and higher interest rates in 2022, and concluding fiscal stimuli, dampened growth of aggregate demand while supply was restored, yielding *disinflation* later in 2022. Hawaii's inflation rate was at or below 2.5 percent pre-pandemic and until March 2021. Hawaii inflation then rose for a *single* year to peak at 7.5 percent in March 2022. Then Hawaii inflation fell for a year to settle at 3.3 percent in March 2023. The "highest inflation in 40 years" [*sic*],<sup>12</sup> was over as quickly as it started.

---

<sup>11</sup> Hawaii's labor force participation rate dropped to 58.3 percent from April-September 2020 during the six full months of air travel quarantine after shutdowns (March 25, 2020) and pre-flight PCR testing protocols (October 15, 2020). Both denominator (labor force) and numerator (workers) *decreased* following pandemic onset: people withdrew from the workforce *and* lost their jobs. In contrast, relative to population as denominator, Hawaii employment drifted downward from 62.9 percent of the population in 1976 to 59.4 percent of the population in 2019, pre-pandemic. Then, during the pandemic "V" from April 2020 – September 2020, the employment/population ratio dropped to 48.1 percent. Hawaii's employment to population ratio recovered to 58.3 percent in 2022, consistent with dynamic equilibrium. (This dynamic equilibrium is a slowly declining pre-pandemic trend from the 1992 peak, in the sunset of the Japan Bubble, of 68.7 percent of Hawaii's population employed to the 58.3 percent estimated in 2022, ten percentage points of Hawaii's population who worked 30 years ago but do not today.)

<sup>12</sup> U.S. inflation widely known "as the highest in 40 years," was *not* in Hawaii, hence the quotation marks. Urban Hawaii inflation in March 2022, at 7.5 percent, was highest in about 30 years, not quite reaching first half 1991 Urban Hawaii inflation at 8.3 percent, during and after Operation Desert Storm in the Persian Gulf War.

**Figure A2.** U.S. and Urban Hawaii consumer price inflation through March 2023



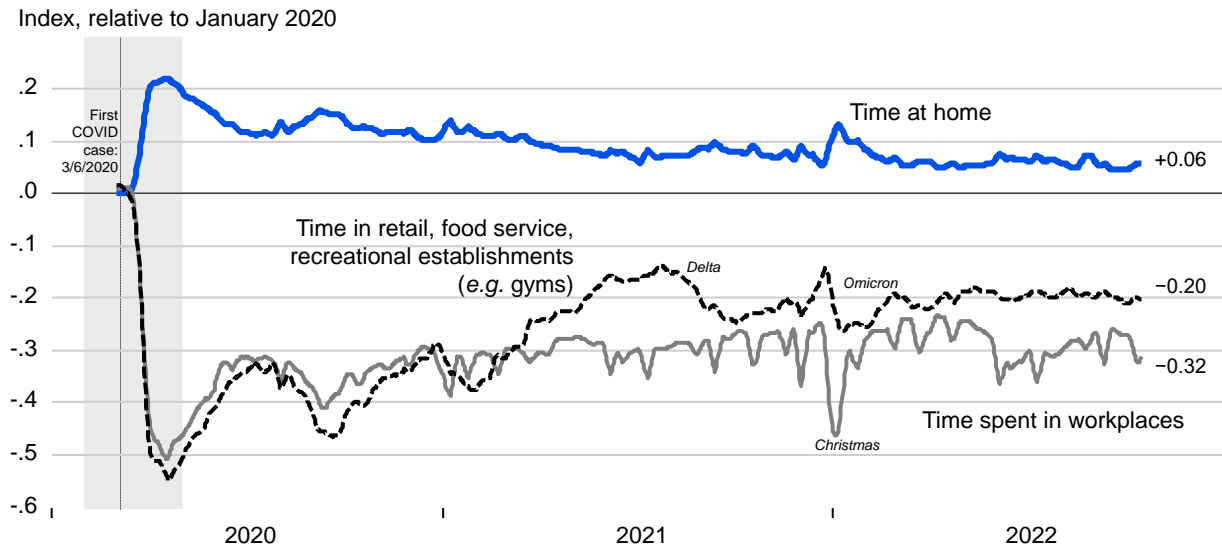
\* Federal Reserve Board ([https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_LongerRunGoals.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf))

Source: U.S. Bureau of Labor Statistics (<https://data.bls.gov/cgi-bin/surveymost?r9>); to facilitate comparison semiannual inflation rates for 2017 and most of 2018 are included with the newer year-over-year inflation estimates for Urban Hawaii inflation at bi-monthly frequencies; U.S. monthly data and Hawaii bi-monthly data thereafter are depicted through March 2023.

- Behavioral shifts.** High-frequency, daily data from Google on smartphone mobility, discontinued in fourth quarter 2022, exhibit a continuing, post-pandemic, persistent increase in time spent at home, and decrease in time spent at work and in commercial establishments. Sheltering-in-place behavior changes preceded executive orders in March 2020, August 2020, and August 2021,<sup>13</sup> but early behavioral shifts towards home and away from work were more pronounced, initially. In 2022, behavioral patterns stabilized in a “new normal” configuration with about 30 percent less time at work, 20 percent less time engaged on the way home from work, and about 5 percent more time at home, including working from home (see Appendix point 4). Inferences borne out in post-covid current population survey and household pulse survey data are that, now, people save time on commuting (10 percent), leave home later to commute, and spend more time parenting and in leisure activities *in addition to* more time working. The challenge for urban renewal: *environs vs.* retail engagement.

<sup>13</sup> See State of Hawaii ([https://governor.hawaii.gov/wp-content/uploads/2020/03/2003162-ATG\\_Third-Supplementary-Proclamation-for-COVID-19-signed.pdf](https://governor.hawaii.gov/wp-content/uploads/2020/03/2003162-ATG_Third-Supplementary-Proclamation-for-COVID-19-signed.pdf) and [https://governor.hawaii.gov/wp-content/uploads/2021/08/2108048-ATG\\_Executive-Order-No.-21-05-distribution-signed.pdf](https://governor.hawaii.gov/wp-content/uploads/2021/08/2108048-ATG_Executive-Order-No.-21-05-distribution-signed.pdf)), and City and County of Honolulu ([https://governor.hawaii.gov/wp-content/uploads/2020/08/2008106-CCH\\_Emergency-Order-No.-2020-25-distribution-signed.pdf](https://governor.hawaii.gov/wp-content/uploads/2020/08/2008106-CCH_Emergency-Order-No.-2020-25-distribution-signed.pdf)).

**Figure A-3.** Google GPS mobility data for Hawaii residents, “time spent at home and away from home”—temporary change turned permanent



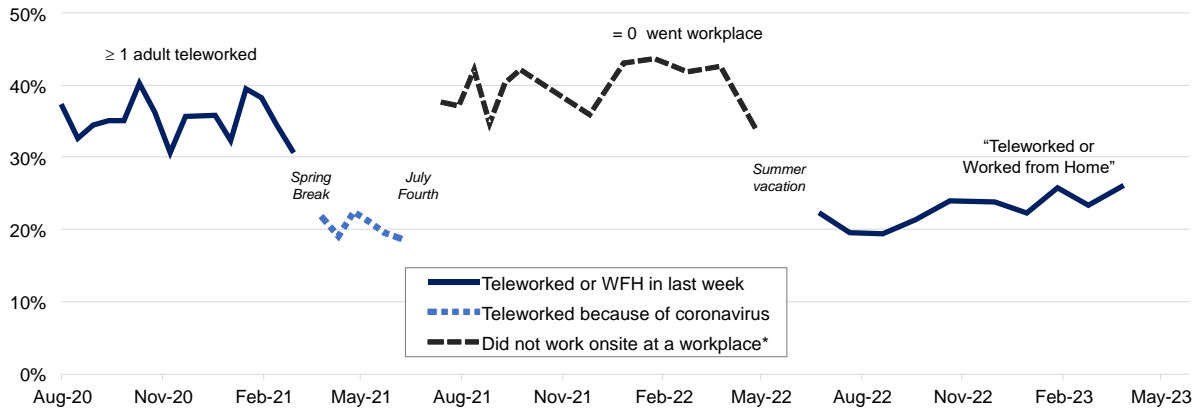
Source: Google COVID-19 Community Mobility Reports (<https://raw.githubusercontent.com/OpportunityInsights/EconomicTracker/main/data/Google%20Mobility%20-%20State%20-%20Daily.csv>).

4. **Remote work.** Through April 2023, rising slightly over 10 consecutive monthly household surveys, an estimated 26 percent of Hawaii’s population 18 years and older “teleworked or worked from home in the last 7 days.” Another 7 percent did not report, and 67 percent reported *not* having teleworked or worked from home in the last 7 days (*i.e.* working in-person). Out of the Hawaii total, those teleworking or working from home of 26 percent, were those who did so 1-2 days/week (8 percent), 3-4 days/week (4 percent), and for 5 or more days/week (14 percent). Just under one-half of Hawaii remote workers were in hybrid work arrangements, about two-third of whom worked at home for 1-2 days/week.<sup>14</sup> Data for Hawaii are not extensive, but U.S. national estimates suggested that only 3-4 percent of workers worked remotely full-time, pre-pandemic, and that fewer than 11 percent did so in hybrid work arrangements. From surveys also showing decreased commute times after the pandemic, full-time remote workers in Hawaii rose from 5 percent of total, pre-pandemic (before 2020) to 11 percent post-pandemic (2021).<sup>15</sup> Working from home is here to stay, and urban redevelopment increasingly will be focused on enhanced neighborhood characteristics.

<sup>14</sup> U.S. Bureau of the Census, Household Pulse Survey (<https://www.census.gov/programs-surveys/household-pulse-survey.html>).

<sup>15</sup> U.S. Bureau of the Census, American Community Survey ([https://data.census.gov/table?g=0400000US15\\_0500000US15003&tid=ACSDP1Y2021.DP03](https://data.census.gov/table?g=0400000US15_0500000US15003&tid=ACSDP1Y2021.DP03)).

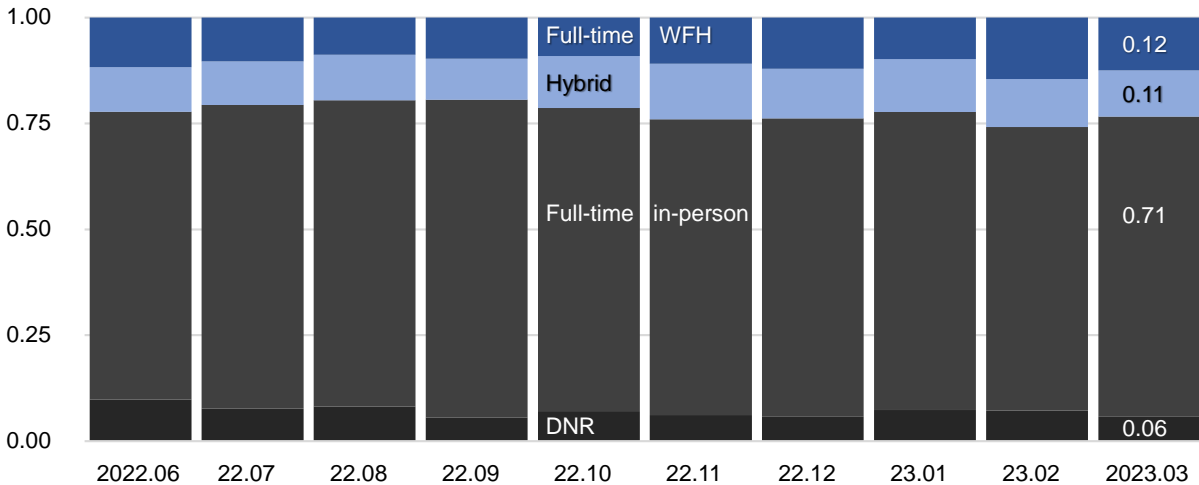
**Figure A-4(a).** Hawaii workers teleworking or working-from-home (WFH)



\* Surveys before April 2021 define "Percentage of adults living in households where at least one adult has substituted some or all of their typical in-person work for telework because of the coronavirus pandemic," from April-June 2021 "Percentage of adults living in households where at least one adult has teleworked because of the coronavirus pandemic in the last 7 days," and beginning in July 2021, "Percentage of adults in households where someone worked onsite at a workplace in the last 7 days (i.e. 65.8% between April 27 and May 9, 2022);" or one-third who did not. Surveys June 1, 2022 through March 13, 2023 identified population shares from households where someone "Teleworked or Worked from Home in the Last 7 Days."

**Figure A-4(b).** Hawaii workers working remotely and in-person at workplaces

Proportion of Hawaii WFH full-time, WFH hybrid, and working full-time in person, or unreported

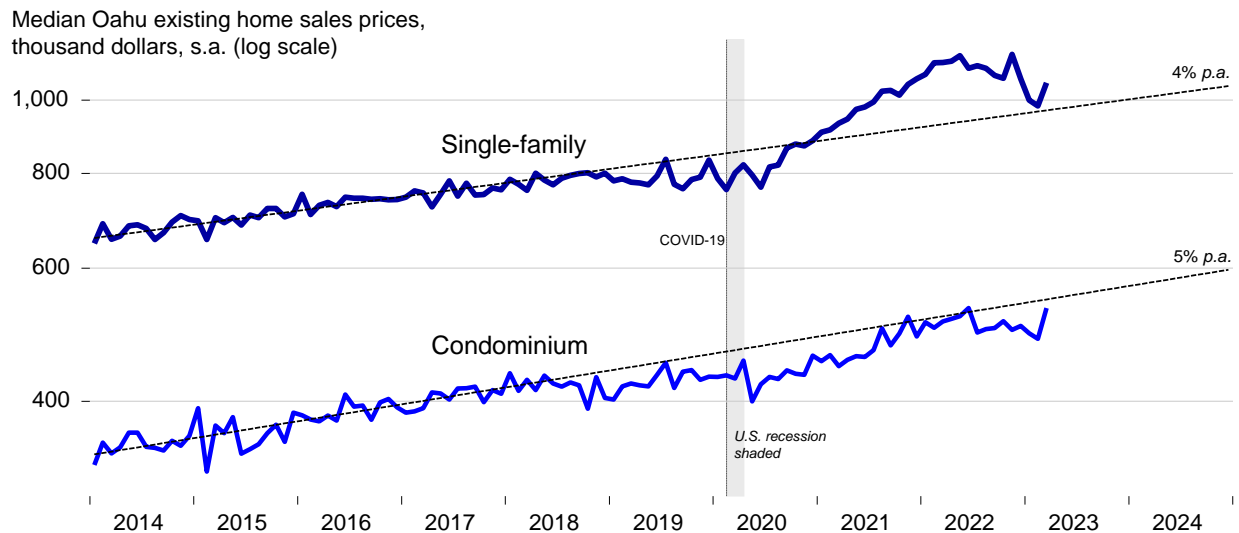


Source: U.S. Bureau of the Census, Household Pulse Surveys (<https://www.census.gov/programs-surveys/household-pulse-survey/data.html>). Data in (a) through survey week 56, March 29 – April 10, 2023. Data illustrated in (b) from survey data June 2022 – March 2023.



5. **Housing price trend convergence.** Oahu median home sales prices and indexes built up from sales prices and mortgage collateral values suggest that a return to longer-term valuation trends is now underway. Longer-run price appreciation on Oahu in the 2010s was around 4-5 percent *per annum*. After adjustment for inflation, real valuations appreciated historically at a rate of 2.0-2.5 percent for a half century. Variations after onset of the 2020 pandemic were more amplified than prior slippage below valuation trend after 2017. After pandemic onset, Oahu home sales prices first surged upward in 2021, predominantly for single-family homes. This partial valuation surge was only temporary, reversing in 2022 after mortgage interest rates began rising. In first half 2023, monthly and quarterly valuations were returning to earlier appreciation trends. Complete trend reversion by the 2025 should accompany current monetary policy posture and forward guidance. Policy-makers' inflation expectations (2 percent<sup>16</sup>) and “neutral” overnight interest rate goals now are higher than in the 2020s,<sup>17</sup> but are consistent with aforementioned Oahu home price appreciation rates, assuming that housing supply responds elastically. This raises the probability that new housing in the late-2020s will be absorbed in a stable asset pricing dynamic environment (*e.g.* no bubbles).

**Figure A-5(a).** Oahu median existing home sales price appreciation reverting to trend

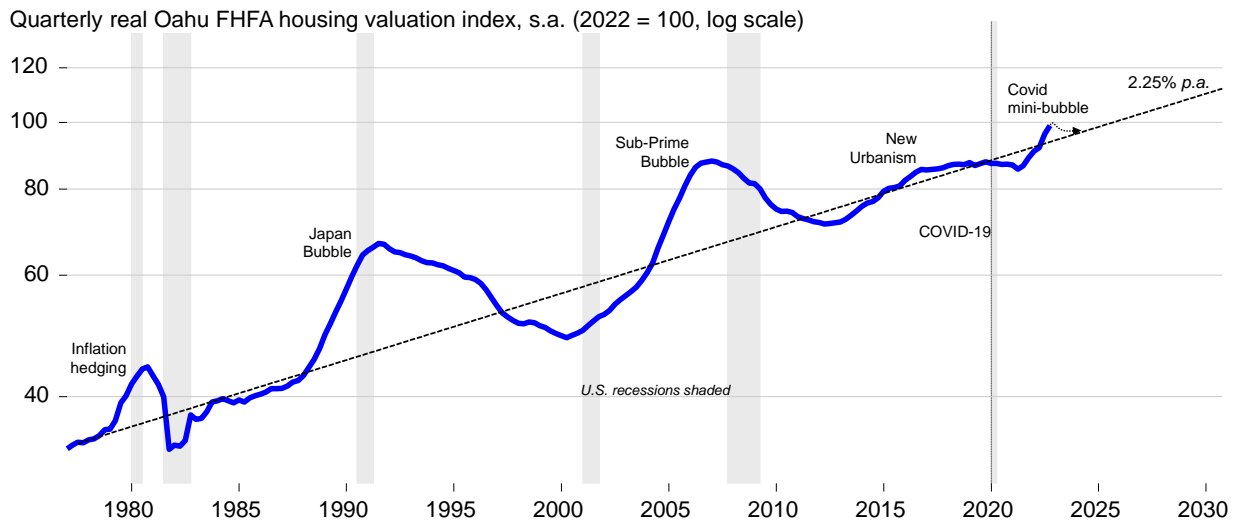


Source: Honolulu Board of Realtors, Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/mei/>); monthly through March 2023; seasonal adjustment, trend regressions by TZ Economics are from mid-2011 through mid-2018, projected forward through period of soft valuations at end-2010s, pre-covid.

<sup>16</sup> PCE inflation is the percentage rate of change in the (non-core, *i.e.* including food and energy) price index for personal consumption expenditures (PCE). Federal Reserve Board, *Summary of Economic Projections* (March 2023) (<https://www.federalreserve.gov/monetarypolicy/fomcprojetabl20230322.htm>).

<sup>17</sup> See footnote 16.

**Figure A-5(b).** Long-term appreciation of *real* (inflation-adjusted) Oahu housing valuations

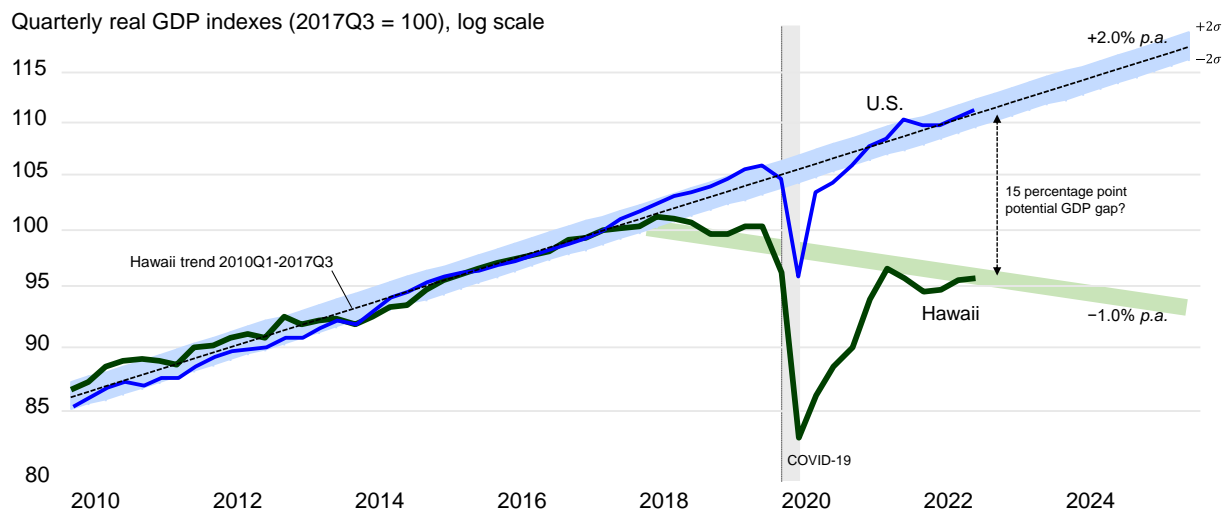


Source: U.S. Bureau of Labor Statistics (<https://data.bls.gov/cgi-bin/surveymost?r9>), Federal Housing Finance Agency ([https://www.fhfa.gov/DataTools/Downloads/Documents/HPI/HPI\\_AT\\_metro.txt](https://www.fhfa.gov/DataTools/Downloads/Documents/HPI/HPI_AT_metro.txt)), through 2022.

- Hawaii’s shrinking economy.** The erosion of housing valuations on Oahu beginning after 2017, temporary derailing valuations from trend, mimics erosion of Hawaii statewide real GDP after 2007, derailing measures of Hawaii real output from trend for five subsequent years, punctuated by the “V-shaped” covid recession and recovery. In Hawaii’s case, however, the post-pandemic recovery of real output, GDP, has *not* returned real GDP to the pre-pandemic trend. Before the pandemic, and for the longest interval in history (more than 11 consecutive years), Hawaii and U.S. real GDP grew on trend very close to a common, 2 percent real annual GDP growth rate. U.S. growth was perhaps two-tenths of one percent higher than 2 percent; Hawaii growth perhaps two-tenths of one percent lower. That real GDP growth trend path is the measure of *potential* GDP realizable given the economy’s productive capacity. Investment activity adds to GDP each year and expands the productive capacity for future output. Through the pandemic and beyond, U.S. real output returned to its long-term potential along the 2 percent growth path from the 2010s. But by end 2022, Hawaii real GDP was about 4-5 percentage points lower than five years earlier, and for five years after 2017, including two pre-pandemic years, Hawaii’s previous 2 percent annual real output growth was forgone for five straight years. Roughly, 10 percentage points of real GDP foregone by not staying on trend, and another 5 percentage points of real GDP in outright reduction (“10 + 5” percent, with compounding), combines to Hawaii in 2023 to a position in which Hawaii output cumulatively has fallen 15 percent below its previous potential GDP

trajectory, the path Hawaii already was on, pre-pandemic.<sup>18</sup> Fading housing valuations during the late-2010s illustrated in both parts (a) and (b) of Figure A-5, pre-pandemic, reflected factors idiosyncratic to Hawaii weighing on investor expectations in 2018 and 2019. Oahu housing asset price appreciation disappeared at that time. Systemic forces—global pandemic and fiscal and monetary stimuli—affected Hawaii in 2020 as they did worldwide and nationwide. The “trend-stationary” post-pandemic recovery of real U.S. GDP to its pre-pandemic path suggests that *systemic* factors continued to enhance potential GDP nationwide, despite the V-shaped covid recession. Fruits of technological progress in smartphone apps, even AI, inventions and innovations are available in Hawaii as elsewhere. Factors common to the entire country explain the 2 percent real potential GDP growth trajectory. Therefore, Hawaii’s deviation below trend is *idiosyncratic*, not associated with systemic forcing factors like higher or lower interest rates. Lack of growth in Hawaii investment activity (renovation and new building construction, for example) could be a factor explaining Hawaii’s real output downslide. Post-pandemic recovery in tourism and steady-state U.S. military expenditures in Hawaii don’t decrease output. Public investment and consumption have not decreased, nor did household consumption after post-pandemic revival. Investment in urban Honolulu redevelopment along well-known plans limits whatever else is causing Hawaii’s economy to shrink.

**Figure A-6.** Pre-pandemic departure of Hawaii real GDP from longer-term 2010s trend



Sources: U.S. Bureau of Economic Analysis (<https://www.bea.gov/data/gdp/gdp-state>, <https://www.bea.gov/itable/national-gdp-and-personal-income>), re-indexing and trend regression estimate by TZ Economics.

<sup>18</sup> Implicit is the assumption that the same technological progress and productivity growth responsible for restored 2020s U.S. real GDP growth, post-pandemic, was available to Hawaii because of knowledge diffusion within an economic union (the U.S.) with high mobility of factors of production like labor, capital, and information. That is, five years of Hawaii real GDP trending downward, 2018-2022 inclusive, is *idiosyncratic*, not systemic.