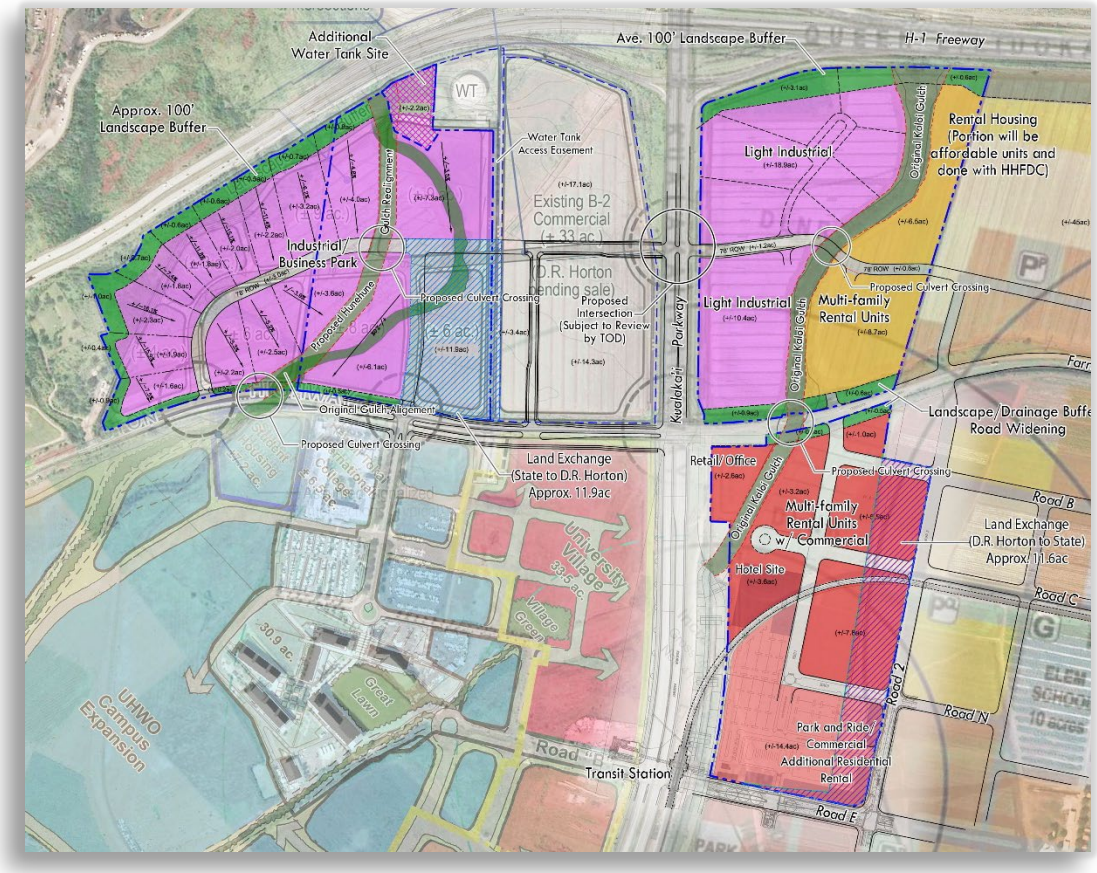
East Kapolei
Strategic Development Plan



R. M. TOWILL CORPORATION
SINCE 1930

December 2020

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Study Context and Potential Impacts of the COVID-19 Pandemic

This report was drafted between November 2019 and August 2020, with reference to consultations, data collection, and analyses conducted between the third quarter of 2018 and the third quarter of 2020. From approximately February 2020, the COVID-19 pandemic caused major economic, social, and business disruptions in Hawai‘i, as it did worldwide. At the time of this writing, the extent of the pandemic’s impacts on development markets and financing, and the timing of recovery remains uncertain.

The development visions presented herein reflect the long-term goals and aspirations of the Department of Land and Natural Resources for its holdings in East Kapolei. Some of the projects described would not be expected to materialize for years or even decades of this study. The assessments presented in this report are tied to future implementation of the desired projects, and while some could be delayed, for purposes of this study, it is assumed that in this longer-term framework, conditions affecting such development in Hawai‘i have recovered to be within the range of outcomes described herein. Nevertheless, prior to implementation of any particular project, as for any development, the conclusions presented herein should be reviewed in the context of then-current market, economic, fiscal, political, and social environments.

1 EXECUTIVE SUMMARY

The State of Hawai‘i (State), Department of Land and Natural Resources (DLNR) is responsible for the utilization of its assets in support of its mission to protect natural, cultural, and historic resources in the State of Hawai‘i. As the City and County of Honolulu (City) proceeds with its development of the Honolulu rail system, the location of certain DLNR land assets in the East Kapolei area that will be impacted by the new rail system poses unique opportunities for DLNR.

Specifically, DLNR is planning to develop four tax map key parcels (TMKs: 9-1-016: 008, 9-1-017: 097, 9-1-018: 008 and 014) in East Kapolei. The parcels are situated in three nearby but non-contiguous areas that are generally bounded by the D.R. Horton development (Ho‘opili) to the east and southeast, University of Hawai‘i West O‘ahu (UHWO) to the southwest, open lands to the west, and the Interstate Freeway 1 (H-1 Freeway) to the north. The H-1 Freeway is the primary corridor connecting west O‘ahu to downtown Honolulu. Kualaka‘i Parkway and Farrington Highway are major regional roadways that will provide the primary access points for the parcels. The three areas are referred to herein as “Kualaka‘i Parkway West” (TMKs 9-1-016:008 and 9-1-018:008), “Kualaka‘i Parkway East,” (TMK 9-1-018-014), and the “Keone‘ae Station Area” (TMK 9-1-017:097).

This strategic development plan includes conceptual development alternatives for the DLNR’s holdings in the East Kapolei area, herein also referred to as “DLNR East Kapolei Lands.” It is understood that the findings from this plan will assist DLNR in its refinement and further progression of its long-range plans for this area.

DLNR is currently negotiating with D.R. Horton for a land exchange involving approximately 11.9 acres within Kualaka‘i Parkway West and approximately 11.6 acres of D.R. Horton land adjacent to the Keone‘ae Station Area. The land exchange would provide D.R. Horton with improved access to its commercial zoned parcels adjacent to Kualaka‘i Parkway West and would provide DLNR with a preferable land configuration, allowing frontage on the planned streets along the south and west edges of its Keone‘ae Station Area.

Additional coordination is required between adjacent landowners for future UHWO and Ho‘opili developments in order to adequately accommodate sewer, water, and drainage demands and connections. In particular, while the addition of proposed sewer extension improvements is expected to provide adequate capacities for the proposed DLNR development, as well as other proposed area developments, it requires that some capacity be reallocated from the UHWO’s Mauka property located to the north of the H-1 Freeway. Vehicular circulation and access also need further evaluation and coordination with State and County agencies and local landowners, as many local roads and access points have not been constructed at the time of this report. Access to Kualaka‘i Parkway West and Kualaka‘i Parkway East will need to be coordinated with proposed intersections along Farrington Highway and Kualaka‘i Parkway.

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2 STUDY FRAMEWORK

2.1 DLNR Background and Mission

The DLNR is responsible for managing, administering, and exercising control over public lands, water resources, ocean waters, navigable streams, coastal areas (except commercial harbors), minerals, and all related interests within the State. The DLNR's jurisdiction encompasses nearly 1.3 million acres of State lands, beaches, and coastal waters as well as 750 miles of coastline. It includes State parks; historical sites; forests and forest reserves; aquatic life and sanctuaries; public fishing areas; boating, ocean recreation, and coastal programs; wildlife and sanctuaries; game management areas; public hunting areas; and natural area reserves. This is embodied in DLNR's mission statement to:

"Enhance, protect, conserve and manage Hawai'i's unique and limited natural, cultural and historic resources held in public trust for current and future generations of the people of Hawaii nei, and its visitors, in partnership with others from the public and private sectors."

DLNR lands not directly protected or utilized for conservation may be made available for market uses if consistent with the above-stated mission of the agency. Income generated from these enterprises could be used for public benefit by helping to support DLNR's primary mission of protecting natural, cultural, and historic resources.

2.2 Purpose of this Study

The DLNR seeks to better understand and plan for the market, development, and income-generating potential of their land holdings in East Kapolei relative to plans initiated by the State and City for Transit Oriented Development (TOD). This study develops and assesses conceptual site development alternatives for the use of DLNR lands located near the City's Keone'ae Rail Station.

In June 2015, the DLNR selected the R. M. Towill Corporation (RMTC) to assist in preparing conceptual plans and supporting studies for the use of its lands in East Kapolei. These plans and studies facilitate the objective of generating revenues for public purposes consistent with future plans for the growth of TOD and rail service in East Kapolei. The study objectives of this project are to:

- Provide DLNR with information to evaluate the feasibility of future land uses, taking advantage of TOD opportunities;
- Optimize opportunities for revenue generation from the use of DLNR lands;
- Serve as a comprehensive guide for DLNR's TOD-related development;

- Support State and City planning for future infrastructure needs in the respective TOD areas; and
- Facilitate coordination of DLNR's plans with those of adjacent landowners.

The DLNR sought to accomplish these objectives by assembling an experienced project team with national and Hawai'i expertise in TOD, physical and economic site evaluation, planning, market assessment, and cost estimating. In this regard, the RMTC project team was comprised of its civil engineers and multidisciplinary consultants including PBR HAWAII (TOD planning and design), Colliers International (industrial and commercial market assessments, and economic impact analyses), Erik Kloninger Consulting (hotel market assessments), and Ricky Cassiday (affordable housing market assessments).

2.3 TOD Benefits

According to the State Office of Planning (OP), the potential benefits of TOD for residents and State agencies, such as the DLNR, include:

- A variety of new land uses to generate revenues from land sales, leases, and/or joint developments;
- Affordable rental housing opportunities through higher density mixed-use development;
- Improved access to State services for customers, employees and the public;
- Opportunities to incorporate alternative modes of transportation;
- Opportunities to incorporate social infrastructure; and
- Reducing capital and operating costs through efficient infrastructure development and reduced parking requirements.

2.4 Planning Parameters

2.4.1 Project Vision and Goals

The vision for the DLNR East Kapolei Lands is the creation of new opportunities for revenue generation and TOD-associated development, while maintaining DLNR's core mission to enhance and preserve the unique resources it holds in the public trust. This strategic development plan also implements key goals of TOD related development since substantial portions of DLNR East Kapolei Lands are located within the City's Keone'ae Station Area. These goals would include the creation of affordable rental housing opportunities, improving access to public agencies and services, and incorporating alternative modes of transportation to reduce our reliance on automobiles.

The accomplishment of the project vision will require determining the development potential of the DLNR lands relative to land uses and services in support of TOD. This report will therefore

examine the creation of rental housing, hotel, retail, and industrial developments, and the provision of transportation access via alternative modes of transportation.

2.4.2 Project Location and Sub-Areas

The DLNR East Kapolei Lands consist of approximately 168.3 acres located on the west side of the island of Oʻahu, Hawaiʻi (approximately 169.1 acres upon completion of the land exchange). The parcels are in three nearby but non-contiguous areas that are generally bounded by the D.R. Horton development (Hoʻopili) to the east and southeast, UHWO, to the southwest, open lands to the west, and the H-1 Freeway to the north. The H-1 Freeway is the primary corridor connecting west Oʻahu to downtown Honolulu. Kualakaʻi Parkway and Farrington Highway are two major regional roadways that provide direct access to the properties (see Figure 1).

The project is comprised of three distinct sub-areas, each of which will be phased based on the recommendations of the technical studies:

- Phase 1 (Yr. 2020 -2029) Keoneʻae Station Area (TMK 9-1-017:097[1]) – 50.8 acres

  The Keoneʻae Station Area is envisioned as a transit-oriented, mixed-use hub with a variety of proposed land uses such as commercial, retail, hotel, medical, and rental housing that embrace opportunities that would be provided by the future UHWO Rail Station. This area has been committed for a 1,000-stall park-and-ride facility to serve future rail operations per agreements involving the City.

- Phase 2 (Yr. 2030 – 2039) Kualakaʻi Parkway East (TMK 9-1-018:014), 58.4 acres

  For the Kualakaʻi Parkway East area, light industrial and rental housing uses are being proposed.

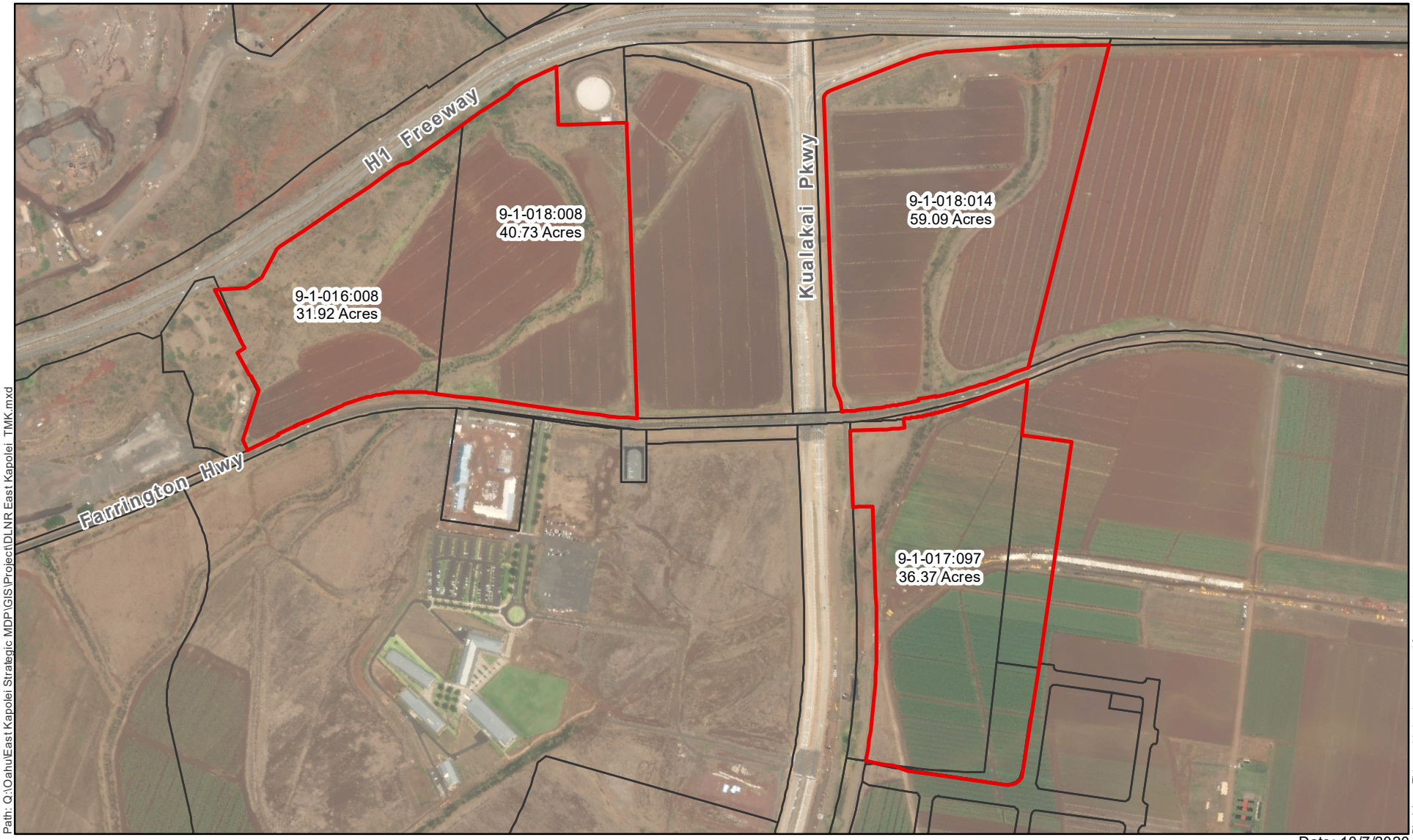
- Phase 3 (Yr. 2040 and beyond): Kualakaʻi Parkway West (TMKs 9-1-016:008, 9-1-018:008 (por.)), 59.9 acres

  The Kualakaʻi Parkway West area is being planned for light industrial/business park uses to support the urban growth in the Kapolei area.

2.4.3 Proposed Land Exchange

DLNR is negotiating with D.R. Horton to exchange approximately 11.9 acres of its Kualakaʻi Parkway West parcel (TMK: 9-1-18: 008) for approximately 11.6 acres of land adjacent to the Keoneʻae Station Area (see Figure 2). This land exchange provides D.R. Horton with improved access to their B-2 (Business Community)-zoned parcel adjacent to Kualakaʻi Parkway, and DLNR with an improved land configuration, along with increased street frontage in the Keoneʻae Station Area.

[1] Includes 11.6 acres from the adjacent parcel as part of the land exchange with D.R. Horton.



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Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Date: 10/7/2020

Legend

- DLNR East Kapolei Project Area
- Tax Map Key Parcels

Source: City and County of Honolulu, 2019; USDA NRCS

Figure 1

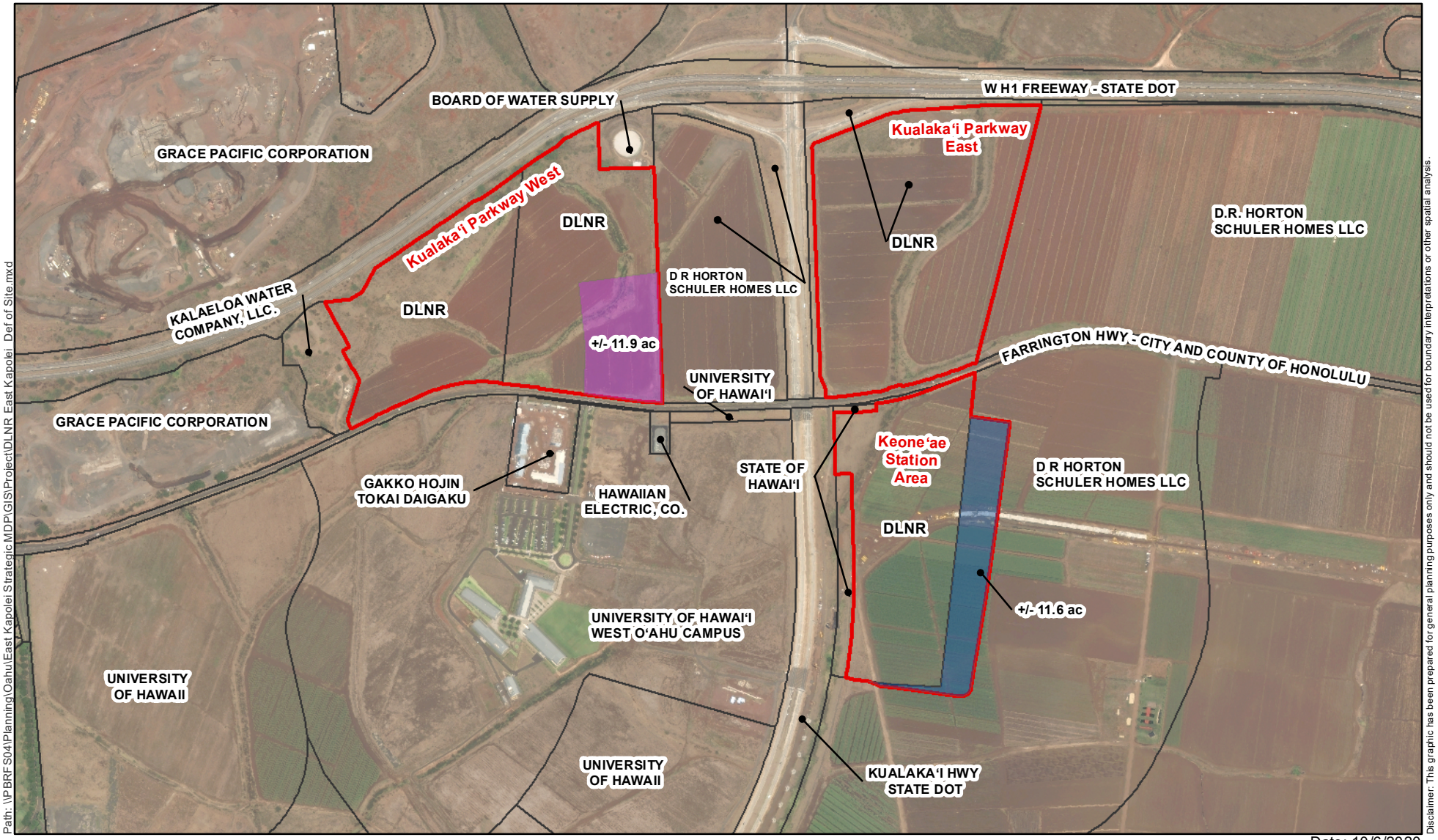
Tax Map Key Parcel
East Kapolei Lands

DLNR North

Linear Scale (feet)

0 200 400 800

Island of Oʻahu



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Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Date: 10/6/2020

Legend

- DLNR East Kapolei Project Area
- Land Exchange D.R. Horton to State
- Land Exchange State to D.R. Horton
- Tax Map Key Parcels

Source: City and County of Honolulu, 2019; USDA NRCS

Figure 2

Definition and Location of Site

East Kapolei Lands

DLNR North

Linear Scale (feet)

0 250 500 1,000

Island of Oʻahu

Specifically, the land exchange provides D.R. Horton with Farrington Highway access for their B-2 zoned parcel as other existing options are limited by the State Department of Transportation-Highways' (HDOT) regulations for sight distance and vehicle stacking. The proposed access road for the D.R. Horton B-2 parcel will also provide access into the Kualakaʻi Parkway West industrial park.

The land D.R. Horton is exchanging to DLNR is located on the eastern boundary of the Keone'ae Station Area and will allow integration of the Keoneʻae Station Area into the Hoʻopili roadway network resulting in increased street frontages and access points for DLNR. The conceptual roadway network can be seen on the Preferred Alternative Conceptual Plan (Figure 12) discussed later in Chapter 6.

As a part of its efforts to add additional land value to the land swap, D.R. Horton is assisting DLNR through the design of infrastructure to accommodate future wastewater capacity, designing sewer systems based on meeting future projected land use capacity through upsized facilities.

2.4.4 Surrounding Roads and Land Uses

Kualakaʻi Parkway and Farrington Highway are the two major regional roadways in the project vicinity. Kualakaʻi Parkway is a divided highway with a raised median connecting H-1 Freeway and Kapolei Parkway, and is owned by the State. The City-owned portion of Farrington Highway between Kapolei Golf Course and Fort Weaver Road is a two-lane highway (one lane in each direction). The State owns and maintains jurisdiction of the Farrington Highway-Kualakaʻi Parkway intersection. The main access to the DLNR project parcels is off Farrington Highway via the Kualakaʻi Parkway H-1 Freeway exit. Farrington Highway borders Kualakaʻi Parkway West and Kualakaʻi Parkway East along their southern borders and separates Kualakaʻi Parkway East from the Keoneʻae Station Area.

Surrounding land uses are as follows:

North

- H-1 Freeway (directly adjacent)
- Grace Pacific Corporation's Makakilo Aggregate Quarry (across H-1)
- Vacant former agriculture lands owned by D.R. Horton and UHWO, respectively

East

- D.R. Horton's 11,700-unit Hoʻopili community, which is mid-way in its development, and located along the eastern boundaries of Kualakaʻi Parkway East and the Keoneʻae Station Area

South

- Farrington Highway borders Kualakaʻi Parkway West and Kualakaʻi Parkway East along their southern borders, and separates Kualakaʻi Parkway East from the Keoneʻae Station Area

- UHWO campus and Tokai University located to the south/southwest of Kualakaʻi Parkway West, across Farrington Highway

West

- Undeveloped lands owned by the Kalaeloa Water Company are located immediately west of Kualakaʻi Parkway West

Other land uses in and around the project parcels include:

- Approximately 36.5 acres of undeveloped land owned by D.R. Horton situated along Kualakaʻi Parkway between Kualakaʻi Parkway West and Kualakaʻi Parkway East
- A 2.5-million-gallon water tank owned by the Honolulu Board of Water Supply (BWS) located along the northeastern edge of Kualakaʻi Parkway West

2.4.5 Rail Service, HART Agreement, and TOD Housing

2.4.5.1 HART Agreement

The Honolulu Authority for Rapid Transportation (HART) was established in 2005 to provide an efficient and reliable transportation alternative for Honolulu's congested urban corridor. The project provides for a rail transit route from East Kapolei to Ala Moana Center, with stations at 21 key commuter and visitor destinations, including Aloha Stadium, Pearl Harbor, Daniel K. Inouye International Airport and downtown Honolulu's commercial and business centers. The rail station closest to the project, the Keoneʻae Station, is a part of the East Kapolei to Aloha Stadium section of the HART system and is scheduled to open in 2021.

In exchange for the "up-zoning" of the DLNR parcels (currently zoned for agricultural uses) by DPP, DLNR has agreed to provide HART with sufficient space at the Keoneʻae Station Area for a 1,000-stall parking lot and bus transfer area as part of the park-and-ride facility for the transit station.

2.4.5.2 TOD Affordable Housing Considerations

According to the 2018 "Implementing an Affordable Housing Requirement" document developed by the City, Oʻahu is experiencing a housing crisis and needs to build more than 24,000 housing units to address current demand: with over three quarters of the demand for households earning less than 80% of the area median income (AMI). The Mayor's Office has developed an affordable housing strategy to address these needs with new and revised policies, incentives, regulations, and investments in partnership with developers, building owners, and other stakeholders. Among the City's priorities are TOD infrastructure investments to support affordable housing, and new TOD zoning around future rail transit stations (Mayor's Office of Housing, 2018).

In 2018, an island-wide affordable housing requirement (Ordinance 18-10, Bill 58, 2017) and associated incentives (Ordinance 18-1, Bill 59, 2017) were adopted by the City Council to help

address the critical affordable housing shortage on O‘ahu and to provide incentives such as fee and property tax waivers for creating affordable units (Mayor's Office of Housing, 2018).

- **Ordinance 18-10, Bill 58, 2017, “Affordable Housing Requirement.”** Signed into law by Mayor Kirk Caldwell on April 3, 2018, the primary purpose of this ordinance is to increase the production of affordable housing throughout the City and maintain the units as affordable for a longer period. It regulates the development and use of real property to ensure that housing production, rehabilitation, and preservation address all income groups (City Council, 2018).

  The ordinance applies to for-sale projects of 10 or more dwelling units and individual conversions and is set to expire on June 30, 2027. Rental projects are exempt from Ordinance 18-10, but affordable rental units may be provided to meet the requirement of for-sale projects. The ordinance focuses on homebuyer households with incomes up to 120% of the AMI and renter households with incomes up to 80% of the AMI. Projects located in TOD zones requesting higher/bonus heights and/or density allowances are required to provide community benefits and have separate affordable housing requirements under the ordinance.

- **Ordinance 18-1, Bill 59, 2017, “Affordable Housing Incentives.”** Signed into law by Mayor Caldwell on February 15, 2019, the primary purpose of this ordinance is to provide financial support for the creation and maintenance of the affordable dwelling units provided through Ordinance 18-10. It provides financial incentives such as real property tax exemptions, tax holidays, and/or waiver of wastewater system facility charges, plan review and building permit fees, and park dedication requirements (City Council, 2018).

  The incentives apply to for-sale affordable units in projects that are governed by Ordinance 18-10; and all units in qualifying affordable rental projects. Qualifying rental projects include those where all units are affordable to households earning up to 140% of the AMI, including 20% of units affordable to households earning up to 80% of the AMI. Actual waivers are determined when building permits are submitted. (This ordinance is set to expire on June 30, 2027).

The conceptual site development plans presented for DLNR’s East Kapolei Lands include provisions for some 1,000 rental units. Based on the market assessment for the project as described in Section 4.2 herein, the greatest housing demand is households earning up to 60% of the AMI. While the exact parameters of housing to be required of a developer have yet to be established, if implementation is expected before June 30, 2027, they should be designed to qualify for the waivers established by Ordinance 18-1. Although not evaluated by the project market study, should the housing alternatively be provided for-sale, such as under a long-term leasehold scenario, it will need to conform with the for-sale requirements of Ordinance 18-10 if developed prior to June 30, 2027.

3 PROJECT INFORMATION

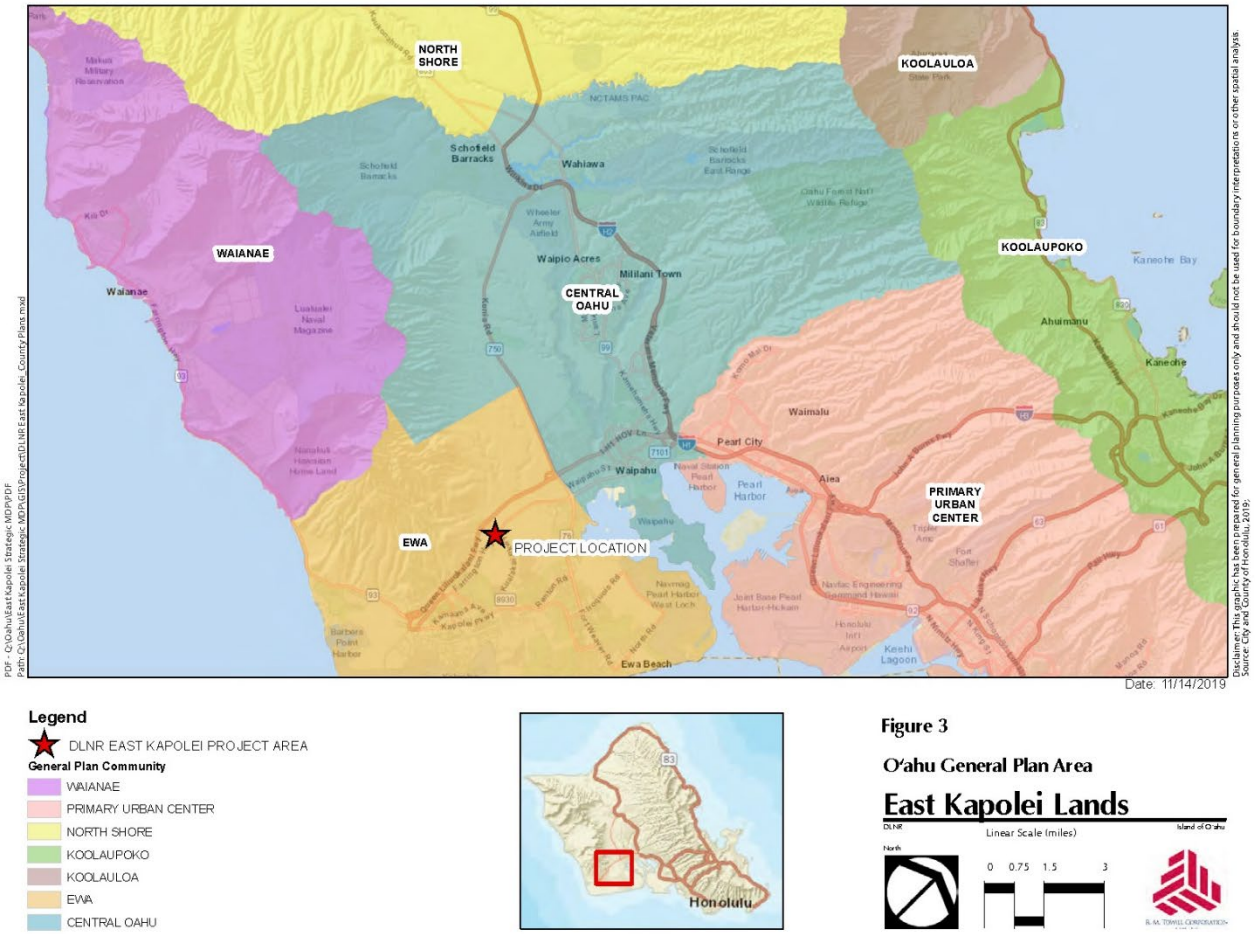
Table 1, below and continued with associated figures on subsequent pages following this page, summarizes project data and includes the land use designation of the site according to State and City controls and regulations.

Table 1: Project Information

	Existing DLNR Lands[2]	DLNR Lands After Land Exchange[3]
Location	Kualakaʻi Parkway and Farrington Highway, Kapolei, HI 96707	
Tax Map Keys	9-1-16:008, 9-1-17:097, and 9-1-18:008 and 014 (Figure 2)	9-1-16:008, 9-1-18:008 (por.), 9-1-18:014, 9-1-17:097, and 9-1-017:138 (por.) (Figure 2)
Land Area	Approx. 168.3 acres	Approx. 169.1 acres
Landowner	DLNR	
Property Configuration	Three non-contiguous, irregularly shaped areas.	
Historic Use	According to an ʻEwa Plantation field map dated 1939, the property was formerly used for agricultural cultivation by the Oʻahu Sugar Company (Kobori, 1940). In 1977, the Honolulu City Council approved a new General Plan, which designated ʻEwa as the location for a secondary urban center for Oʻahu, to be centered in the Kapolei area.	
Existing Use	Undeveloped. The Hunehune and Kaloʻi Gulches traverse Kualakaʻi Parkway West and East, respectively.	

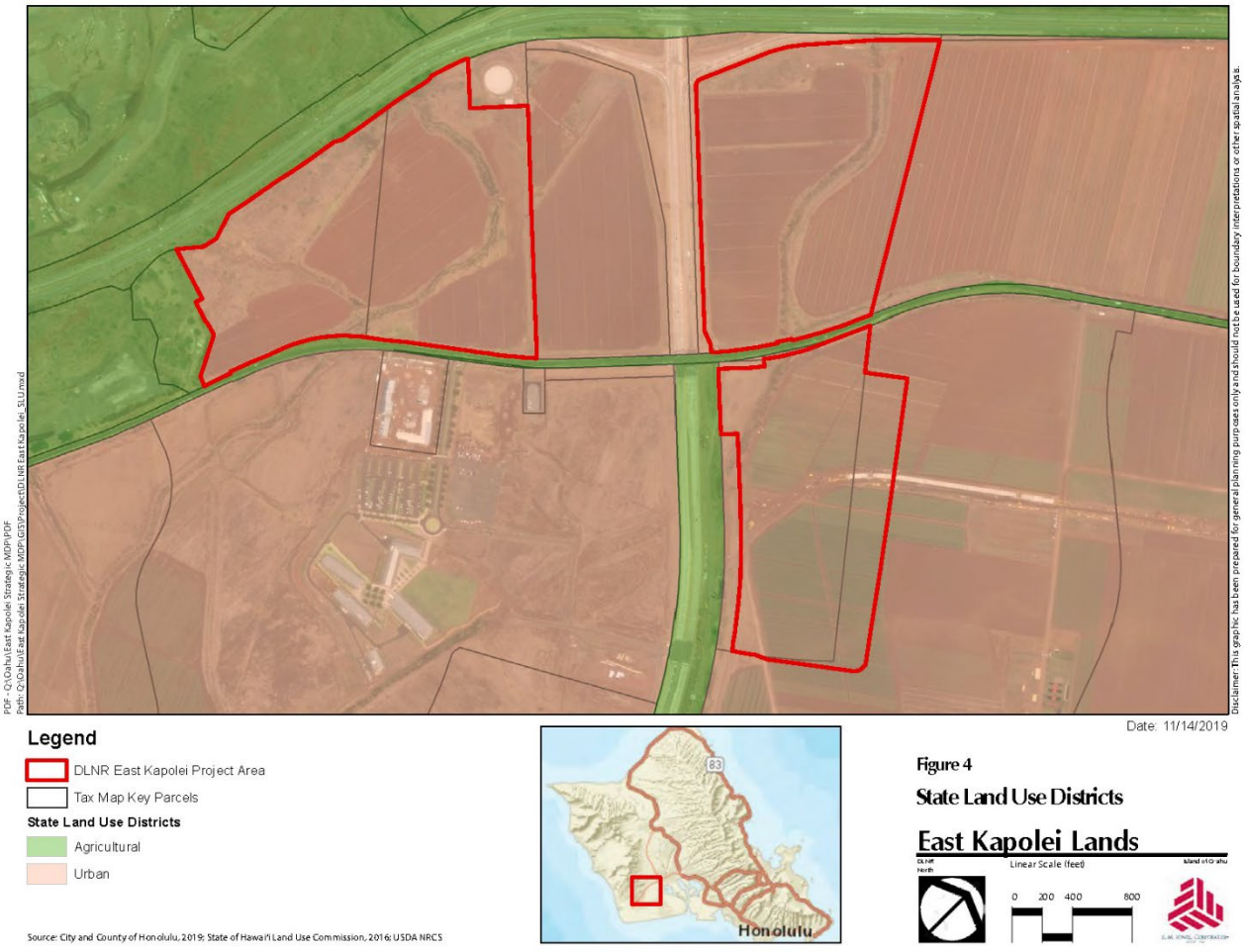
[2] Currently owned by DLNR.
[3] Includes lands proposed for exchange, currently owned by D.R. Horton.

Figure 3: O'ahu General Plan Area



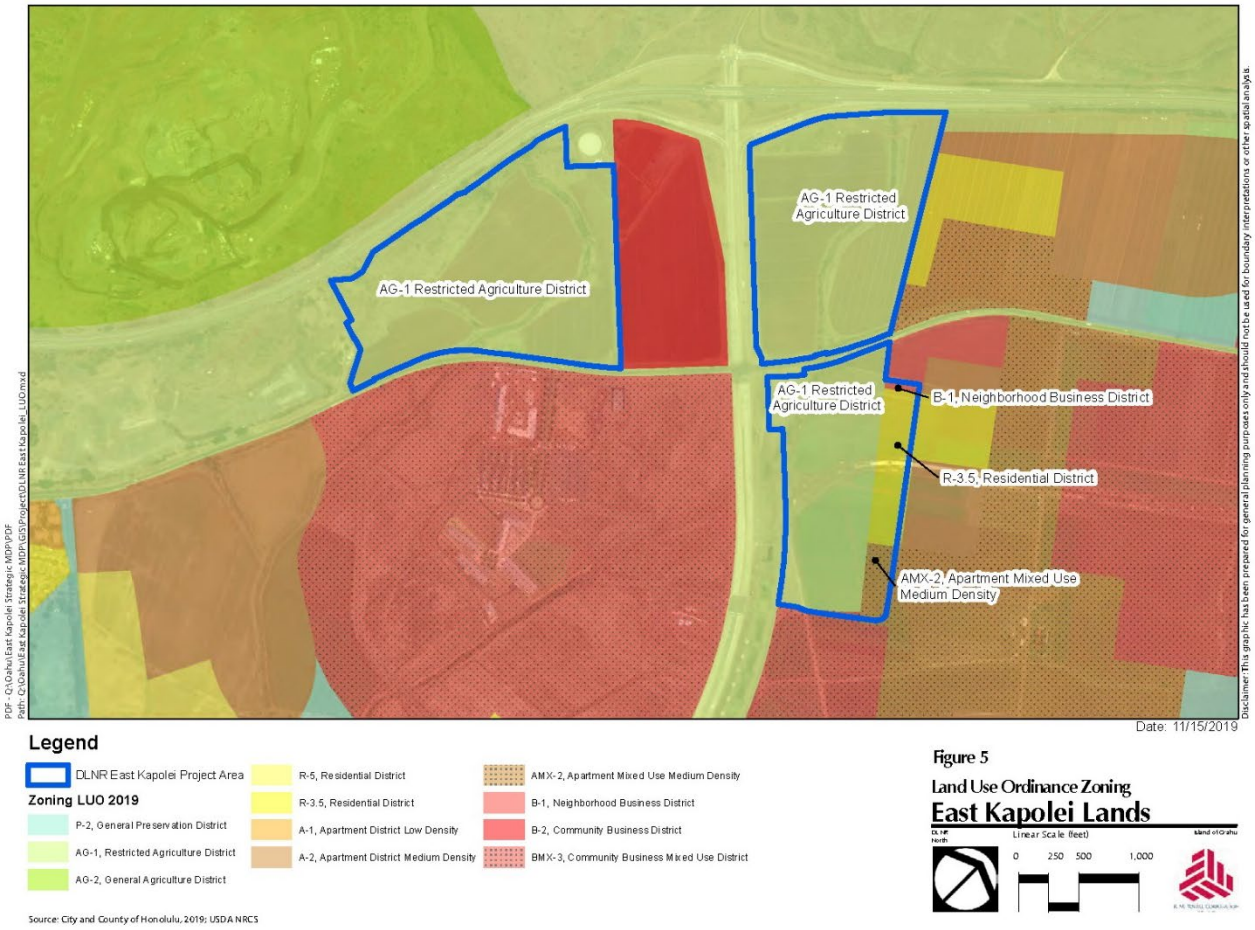
	Existing DLNR Lands
Island/District	O'ahu / 'Ewa District (Figure 3) The project supports the objectives and policies of the O'ahu General Plan through encouraging development within the secondary urban center at Kapolei to relieve developmental pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center, as well as integrating and supporting the proposed mass transit system that is also a policy of the O'ahu General Plan.

Figure 4: State Land Use Districts



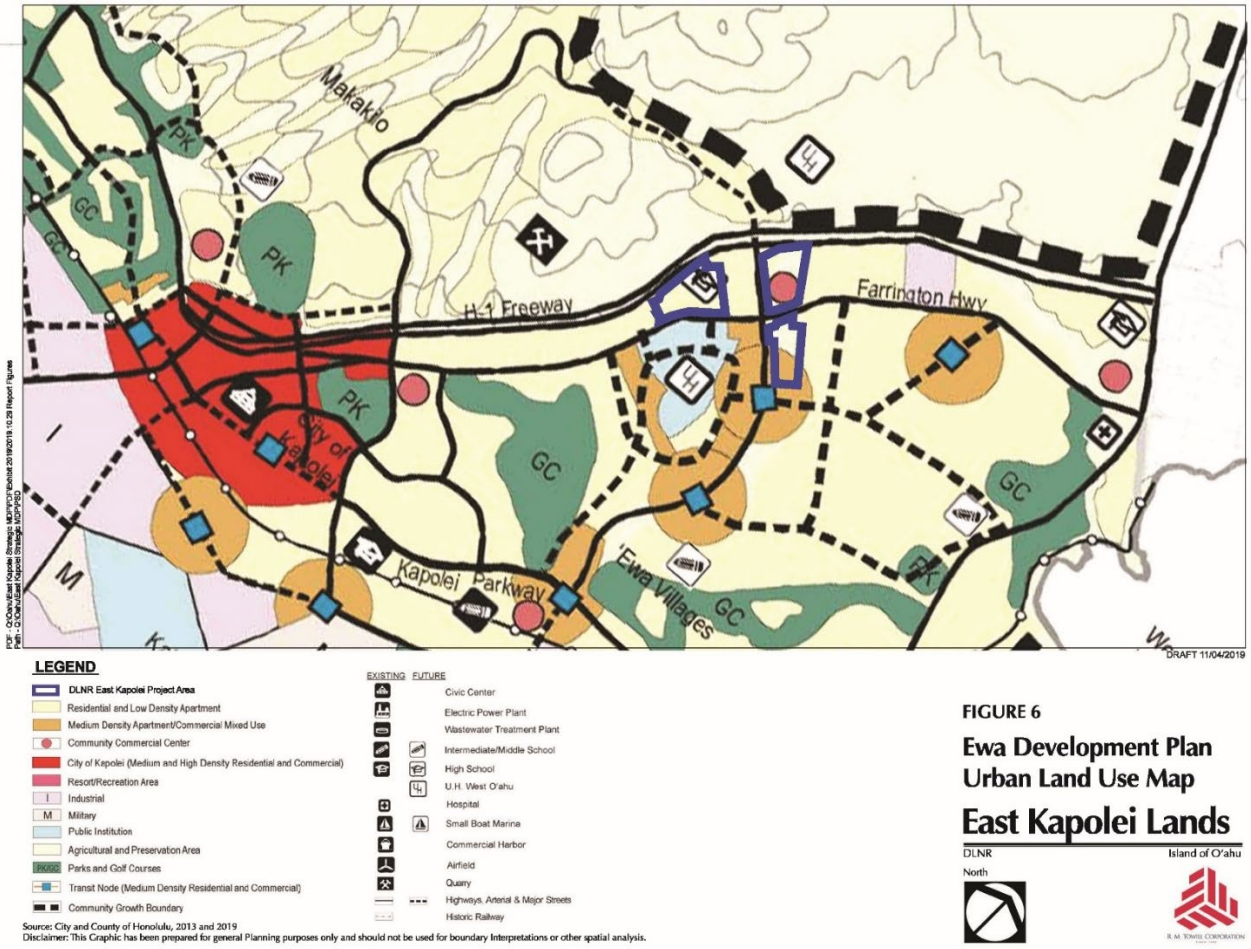
	Existing DLNR Lands
Current Land Use Designations	*State Land Use:* Urban (Figure 4) The proposed project supports the goals and objectives of the Urban State Land Use Designation by providing master planning that characterizes a "city-like" concentration of people, structures and services, while also including vacant areas for future development.

Figure 5: Land Use Ordinance Zoning



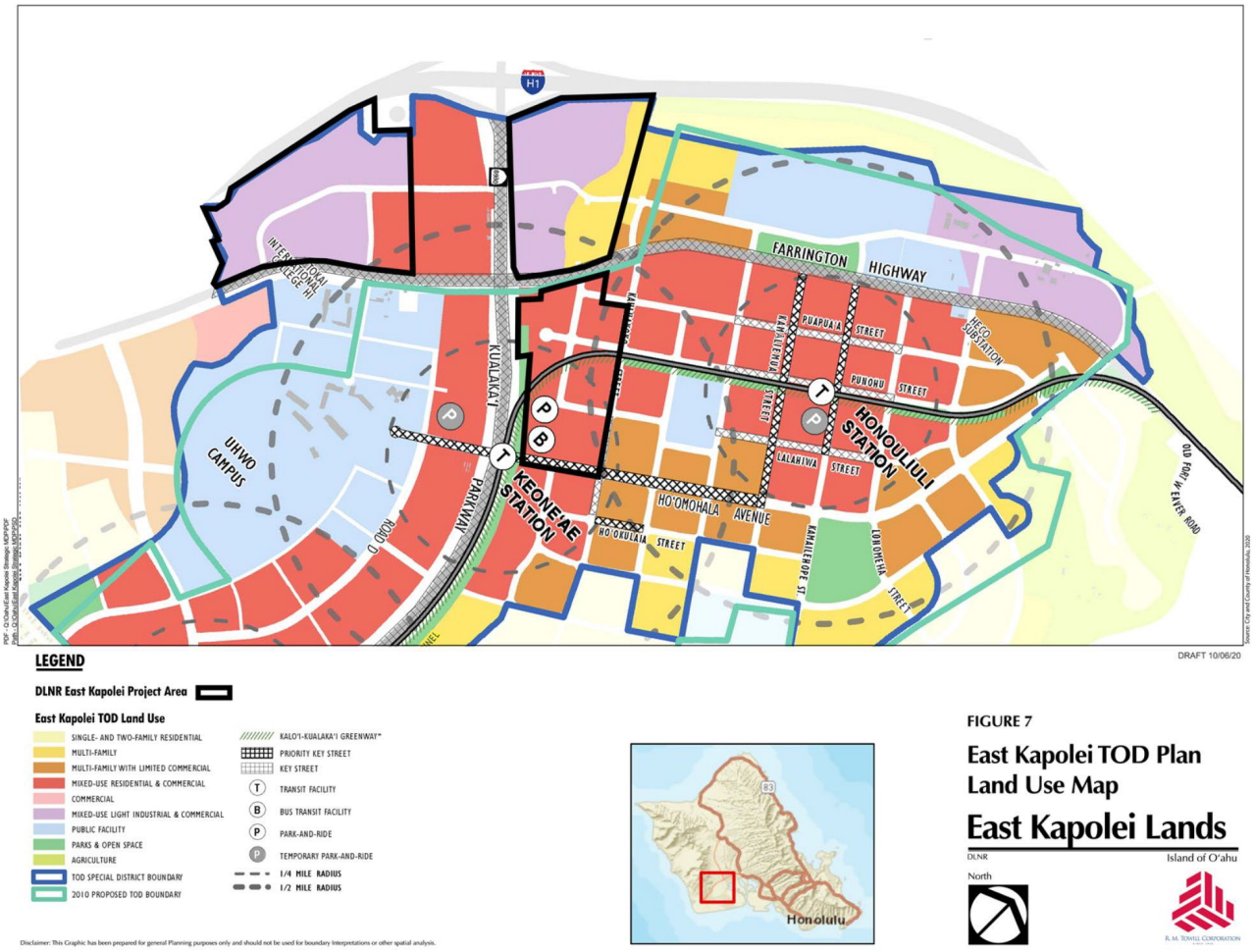
	Existing DLNR Lands	DLNR Lands After Land Exchange
Current Land Use Designations	*LUO Zoning (LUO):* "AG-1" (Restricted Agriculture District), 15 to 25-foot height limit. (Figure 5).	Typically, all AG-1 portions of the project would require rezoning to allow DLNR planned development; however, as a result of DLNR's agreement with the City to provide land for HART's park-and-ride facility at the Keone'ae Station Area, DPP has included the DLNR parcels in the East Kapolei TOD plan allowing for commercial and residential uses. Lands received from the D.R. Horton land exchange are currently zoned B-1 (Neighborhood Business District) R-3.5 (Residential District) and AMX-2 (Apartment Mixed Use Medium Density).

Figure 6: 'Ewa Development Plan Urban Land Use Map



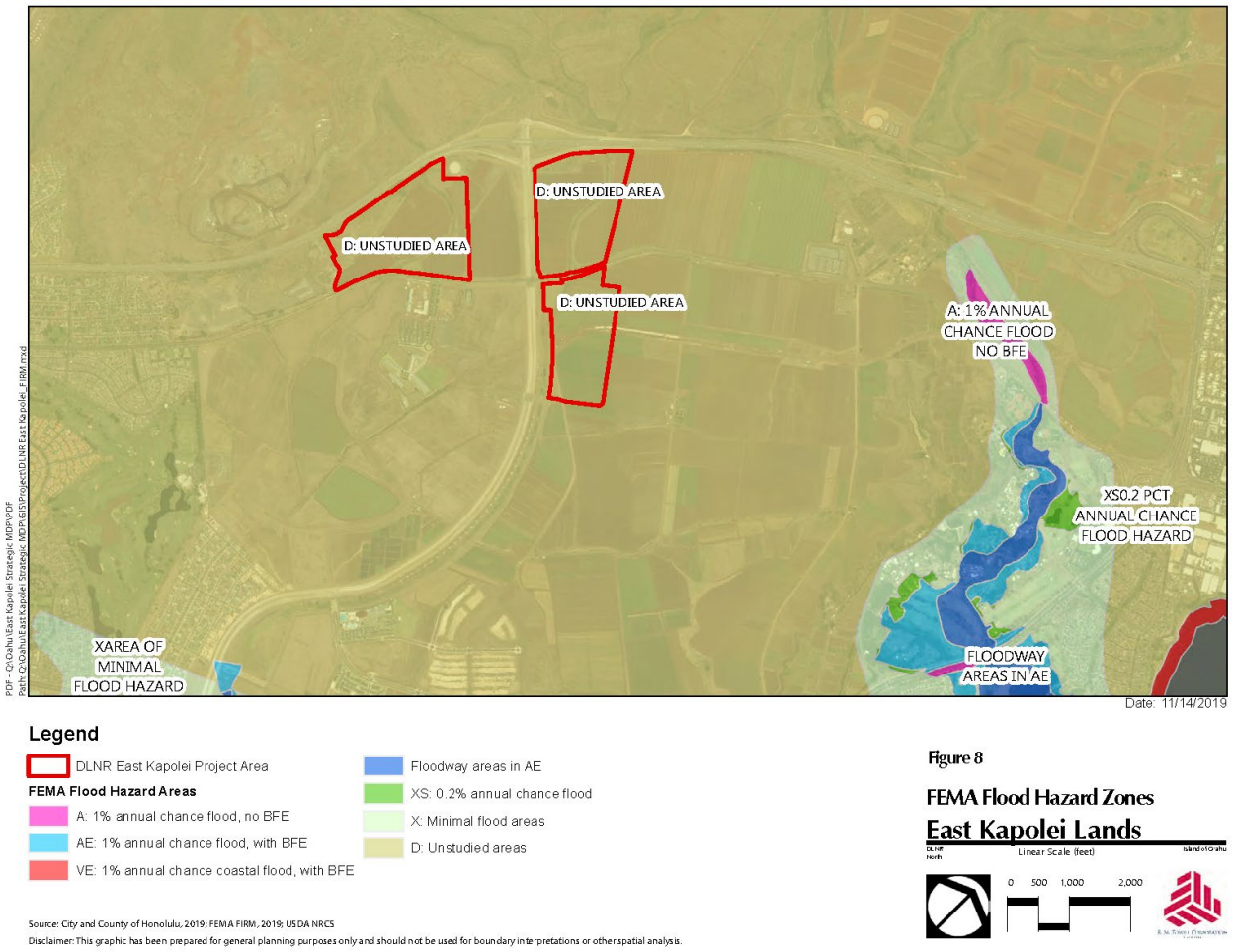
	Existing DLNR Lands
Current Land Use Designations	<u>*City 'Ewa Development Plan (EDP):*</u> Based on the Urban Land Use Map, the Kualaka'i Parkway West and Kualaka'i Parkway East parcels are designated as Residential and Low-Density Apartment. The Keone'ae Station Area is designated as Residential and Low-Density Apartment and Medium-Density Apartment/Commercial Mixed Use (Figure 6). The project supports the goals and objectives of the City and County of Honolulu 'Ewa Development Plan by: - Helping to grow a second urban center for O'ahu centered in Kapolei, with employment opportunities in job centers highlighted in the EDP including the University of Hawai'i West O'ahu area and industrial areas, and; - Providing a wide range of master planned residential areas to relieve developmental pressures on O'ahu's rural areas and provide housing types not readily provided in the Primary Urban Center.

Figure 7: East Kapolei TOD Plan Land Use Map



	Existing DLNR Lands
Current Land Use Designations	<u>*East Kapolei TOD Plan:*</u> The City's East Kapolei TOD Plan currently under review by the City Council suggests land uses for the Keone'ae Station Area, including Commercial/Office, Active Retail Space, Park-and-Ride/Parking, Open Space/Drainage (Figure 7). For both the Kualaka'i Parkway West and East areas, the plan indicates mixed-used light industrial and commercial uses; along with some multi-family residential use specifically in the Kualaka'i East Area. Preliminary plans for this area support the goals of the East Kapolei TOD plan by providing commercial, office, active retail space, residential, park-and-ride and parking areas, and drainage support.

Figure 8: FEMA Flood Hazard Zones



	Existing DLNR Lands
Flood Zone Designation	All parcels, including lands part of the potential land swap with D.R. Horton, are in the Federal Emergency Management Agency (FEMA) Flood Hazard Zone D, areas where no analysis of flood hazards has been conducted (Figure 8)

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4 MARKET AND ECONOMIC CONTEXT

4.1 Industrial and Commercial Market Assessment

This section provides a summary of industrial and commercial market considerations based on an examination of the project site relative to present market conditions. RMTC engaged Colliers International Consulting (Colliers) to assess the potential market demand for various development options on DLNR lands, including industrial park, retail shopping center and office/medical office uses. The Colliers report was prepared in February 2020 and is included herein as Appendix A. The report findings are summarized below.

4.1.1 Industrial Market Assessment

The O‘ahu industrial market as a whole remained one of the tightest industrial markets in the country at year-end 2018, even as vacancy rates rose above 2.0% for the first time in four years. Prospective tenants continued to face a challenging leasing environment, including a lack of prime available space, rising land prices, and a lack of warehouse development. The University of Hawai‘i Economic Research Organization’s fourth quarter economic forecast indicated that the State’s gross domestic product would likely improve by a nominal 1.3% for 2019. The industrial market performs with the rise and fall of the economy.

The West O‘ahu industrial marketplace (comprised of roughly 6.86 million square feet of inventory) posted a loss of 62,072 square feet of tenant occupancy at the end of 2018, resulting in vacancy rates increasing to 4.18% from 2017 rates of 3.27%. Nonetheless, the year end 2018 average asking base rent for West O‘ahu industrial space rose by 5% to $1.25 per square foot per month. Colliers projects that rents will continue to escalate as warehouse development, which has been limited to a few speculative developments, will not materially change the severe shortage that currently exists.

By 2034, projections for total industrial demand for land will have risen to 176.3 acres of which a small percentage would be captured (conservative 10% to aggressive 20%) by the subject site’s leasehold industrial park. Additionally, the best time to introduce an industrial park to the marketplace would be between 2029 and 2034 when economic and market conditions are projected to be advantageous for industrial land sales. In summary, there is potential market demand to support a 30-acre industrial park to be delivered between 2029 and 2034. Industrial park use would be developed within the Kualaka‘i Parkway West and a portion of the Kualaka‘i Parkway East area.

4.1.2 Commercial Market Assessment

The O‘ahu retail market as a whole increased by more than 2.1 million square feet of new tenancy in 2018, as occupancy growth continued for the eighth consecutive year. For 2018, the retail market benefitted from occupancy growth for newly expanded regional retail centers, the delivery of several new strip centers, and the leasing of several large vacant big box stores.

O‘ahu’s job growth posted a gain of 20,600 new positions over 2018, keeping the island’s unemployment rate at 2.3%, among the lowest in the country. In addition, tourist arrivals gained 4.6% over the prior year, with visitor expenditures rising to $8.162 billion, a gain of 7.2% over 2017 levels.

The overall O‘ahu office space market posted vacancy rates ranging from 12% to 14% for more than seven years, and at year-end 2018 had not deviated from this trend. Typically, after an extended period of healthy office job growth, the office market responds with a decline in vacancy rates. The office sector has generated a gain of more than 16,000 jobs since the end of 2010, with 5,400 new office jobs added in the past year alone, the largest number of new jobs among the major industry sectors. Leeward, East and Windward O‘ahu office submarkets have posted lower vacancy rates and stronger tenant demand than those located in the Central Business District of downtown Honolulu. Suburban office markets have been the primary driver of office rental rate increases between 2013 and 2017.

4.1.2.1 West O‘ahu Retail and Commercial Office Market

The West O‘ahu retail market is comprised of 1.74 million square feet of retail shopping centers and is situated among the island’s fastest growing residential populations. At the end of 2018, the West O‘ahu retail market generated its seventh consecutive year of positive net absorption resulting in vacancy rates falling to 7.24%. West O‘ahu retail rents continued an upward path, gaining 27% since the end of 2012. The increase in retail rents contributes to the heightened interest by developers to build additional retail uses in the area.

The Leeward O‘ahu office market is comprised of 719,228 square feet and encompasses a wide geographic area inclusive of Kapolei, ‘Ewa Beach, Pearl City, Waipahu and Mililani. At year-end 2018, the Leeward O‘ahu submarket generated a positive gain of 31,617 square feet of office tenancy resulting in a drop to the area’s vacancy rate to 5.84%. Due to these healthy market conditions, the Leeward office market’s asking rental rate range has exceeded those of urban Honolulu. At year-end 2018, most office rents in this market fell between $2.17 per square foot per month (psf/mo) and $2.39 psf/mo, compared to an island-wide average of $1.76 psf/mo. Tight market conditions are likely to push rental rates upward, however high costs of land and construction pricing, combined with overall low office rents will likely inhibit developers from building additional office in Kapolei.

There is limited consumer support for additional retail development in the West O‘ahu market until after 2029. Retail demand will grow to support a retail center sized between 70,000 and 110,000 square feet by 2034 in the Keone‘ae Station Area. Additional phases to this retail development could expand to a 120,000 to 168,000 square foot development by 2039. This retail center would focus on providing goods and services to transit passengers, hotel patrons and residents within 1-mile of the Keone‘ae Rail Station.

In addition to retail development, there is market support for office development within the Keone‘ae Station Area, ranging from approximately 8,000 square feet to 11,750 square feet

delivered in 2029. By 2039, office demand is projected to increase to a conservative 16,000 to 23,500 square feet. Colliers recommends building 16,000 to 24,000 square feet of office space with a target delivery date between 2034 and 2039. The retail center development could potentially include second floor office space to accommodate this demand.

As part of this study, Colliers compiled a list of medical service tenants located within a 2-mile radius of the Keoneʻae Station Area. Based on the number of medical services tenants and their respective number of employees, Colliers believes 20% to 25% of the proposed office space development could be allocated for medical office space (approximately 3,000 to 5,000 square feet).

4.2 Rental Housing Market Assessment

Hawaiʻi has one of the lowest home ownership rates in the nation and is considered to be among the least affordable housing markets. This can be attributed to the limited supply of land, very high costs of production and strong housing demand, resulting in low housing production and high prices. The problem is exacerbated by the fact that housing prices have exceeded household incomes for over 25 years.

Given high demand and low supply, low- to moderate-income households currently have limited options for housing. This condition has existed for over 25 years, and continues today, with Honolulu being named as the least affordable housing market in the nation in a number of studies.

Although for-sale housing was a consideration, DLNR has expressed a desire to maintain fee simple ownership of the project areas. Accordingly, real estate consultant Paul “Ricky” Cassiday was engaged by RMTC to describe and analyze the residential rental market demand for the City of Kapolei along with the surrounding areas of West Oʻahu, Mililani, and Pearl City/Aiea, with particular consideration of the DLNR East Kapolei Lands. His report, dated November 2019, is attached as Appendix B. The report findings are summarized below.

4.2.1 Affordable Rental Demand

The Cassiday report examines in detail the rental market demand, both affordable and market rate rentals, for the project area. Interestingly, the data indicates that there will **not** be significant demand for rental units coming for those in the 100% or higher Area Median Income (AMI), or from market rate rentals. As discussed in the report, among other factors, current market rents in the area already are similar to the rents that are mandated by the Hawaiʻi Housing Finance & Development Corporation (HHFDC) affordable rental guidelines, thus it is unlikely those households will participate in a more restrictive affordable rental unit project. In addition, those making 100% of AMI have sufficient income to convert to home ownership, at least in a starter multi-family housing development in the area.

According to Cassiday, the "tipping point" for affordable rentals appears to be between 60% to 80% of AMI. By this it means that market rents are below what is mandated by the affordable rental guidelines. Essentially, the current market's rental production is accommodating households making above the 80% AMI level; thus, any type of affordable rental housing programs under consideration should address those below 80% AMI. Put in another way, the only households unable to afford units at market rents currently are those earning 30%—60% of AMI. The households in this income range constitute the demand for affordable units rented out below market level rates (*i.e.,* households who will benefit from the HHFDC guideline rates).

The table below shows an estimated multi-family housing unit supply pipeline organized by market and location, including units that might be provided in the DLNR East Kapolei Lands. The report shows potential market support for DLNR to fulfill this need in West O'ahu based on the assumption that DLNR might be more proactive than other landowners in supporting affordable housing, offering builders and affordable housing developers better value packages (including a very low cost of leasing the land).

Table 2: Affordable Rental Multi-Family Unit Supply Pipeline and Market Opportunity

Year	East Kapolei HHFDC	Ho'opili Horton	Others (UHWO, Kalaeloa)	DLNR East Kapolei DLNR[4]	Total Units
2020	110		35		145
2021		90	35		125
2022	110		35		145
2023		90	35	150	275
2024	100		35	150	285
2025		90	35	150	275
2026	100		35	150	285
2027		90	35	150	275
2028	100		35	150	285
2029		90	35	150	275
2030	90		35	150	275
2031		90	35	150	275
2032			35	230	265
2033		90	35	150	275
2034			35	230	265
2035		90	35	150	275
TOTALS	**610**	**720**	**560**	**2,110**	**4,000**

[4] This represents Cassiday's estimate of supportable affordable rental units on the DLNR East Kapolei Lands. Note that the preferred plan for DLNR, as described below, provides for 1,000 units.

The recommendations outlined are based on historically observed market considerations and should be reviewed in the contexts of entitlement, physical planning, traffic, infrastructure, cost and other feasibility considerations. Federal, state and county policies in effect at the time of development will also affect considerations for underwriting and phasing of developments.

4.2.2 Conclusions

The Cassiday analysis showed potential demand in household segments making 30%, 50%, and 60% of AMI, potentially higher than 2,000 units. However, his analysis notes that financing and construction costs present significant barriers to producing affordable rental units which will require significant subsidies to overcome such development costs. This strategic master development plan includes provisions for some 1,000 units.

4.3 Hotel Market Assessment

A Hotel Market Assessment and Development Outlook report was completed by Erik Kloninger Consulting (Kloninger) in February 2019 under subcontract to Colliers (See Appendix C). The purpose of the report was to analyze the potential for hotel development within land under jurisdiction and ownership of the DLNR in East Kapolei. These lands are in proximity to land utilized by the UHWO campus and the Keone‘ae Rail Station.

4.3.1 O‘ahu & West O‘ahu: Hotel Room Supply and Market Performance

In 2018, O‘ahu had one of the strongest hotel markets in the U.S. Among the top-25 national lodging markets, O‘ahu achieved the second highest hotel occupancy (83.9%), third highest average daily rate (ADR) ($238.00/day), and second highest room revenue per available room ($200.00/room). The majority of this performance was centered in Waikīkī which has the majority of visitor accommodations on O‘ahu:

Total Visitor Accommodations on O‘ahu

Waikīkī	Percent	O‘ahu	Percent
30,818	78.9%	39,089	100.0%

Although Waikīkī continues to have a dominant share of O‘ahu’s hotel rooms, capacity constraints in Waikīkī have limited the growth of new hotel supply. As a result, new hotel development has taken place elsewhere on the island, notably in the Kapolei sub-market.

West O‘ahu, which includes the Kapolei sub-market, Ko Olina Resort and the Wai‘anae Coast, has 3,270 visitor rooms, or 8.2% of O‘ahu's total room count. The supply of rooms increased by 20.2% since 2014, driven by growth in hotel supply and Vacation Rentals. The two newest hotels on the island are located in the area, the 175-room Hampton Inn (2016) and the 180-room Embassy Suites (2017). Both hotels are reportedly performing well, achieving occupancies and ADRs comparable to the O‘ahu market. The Kapolei hotels serve a mix of government/military, corporate and leisure segments. A third Kapolei hotel, the Residence Inn Kapolei, was opened in November 2019.

Traditionally, hotels located outside of Waikīkī tended to achieve lower occupancy rates than Waikīkī hotels, but in 2018 the gap narrowed, with the other O‘ahu visitor accommodations segment achieving 81.2% occupancy, an increase from the mid to upper 70% range achieved in the previous four years.

4.3.2 O‘ahu Hotel Demand by Purpose of Visit

According to the Hawai‘i Tourism Authority, about 3.1 million visitors to O‘ahu in 2018 indicated they intended to stay in a hotel while on the island. Total nightly hotel demand on O‘ahu is about 26,500 rooms on an annual basis. The leisure market accounts for 70.2% of nightly O‘ahu hotel room demand. Of the non-leisure demand, the corporate market accounts for 6.1 % of demand, or some 1,631 occupied rooms each night, followed closely by the meeting, convention & incentive (“MCI”) market, visit friends or relatives ("VFR") at 5.7% of demand and military & government demand also accounting for 5.7% of hotel room demand. (It should be noted that this analysis does not include demand for accommodations generated by O‘ahu residents or visiting residents of the Neighbor Islands.)

Table 3: O‘ahu Hotel Demand by Purpose of Visit: 2018

	Leisure	Visit Friends or Relatives	Meeting, Convention & Incentive	Corporate	Sporting Event	Military & Gov't.	Attend School	Other	Total
No. of Visitors	2,364,836	100,751	203,524	103,415	24,761	66,481	7,957	210,527	3,082,252
Average Length of Stay	6.4	9.1	5.1	7.6	6.6	10.1	18.3	5.5	
Visitor Nights	15,134,952	915,825	1,046,112	780,784	163,669	672,120	145,927	1,153,690	20,013,080
Average Party Size	2.4	1.8	2	1.4	2	1.3	2.3	3	
Hotel Room Demand	6,202,849	500,451	512,800	542,211	80,230	501,582	62,630	437,004	8,839,757
Nightly Hotel Room Demand	18,571	1,498	1,535	1,623	240	1,502	188	1,308	26,466
Percent of Total	70.20%	6%	5.80%	6.10%	0.90%	5.70%	0.70%	4.90%	100.00%

As noted by Kloninger (2019), any proposed new hotel must be capable of capturing demand from a number of demand segments; market interviews suggest that the existing hotels in Kapolei are capturing a part of the 70.2% leisure demand on O‘ahu, in part due to their lower room rates compared to nearby beachfront resorts such as at Ko Olina.

Other demand segments that favor DLNR East Kapolei lands include the UHWO and Tokai University campuses, which could generate demand from students and visiting faculty. The

Central Oʻahu Regional Park, Waipiʻo Soccer Complex, and Aloha Stadium (via rail), could also provide a niche market for visiting teams, players, athletes and support staff. Other demand generators include corporate interests from the James Campbell Industrial Park and Ko Olina Resort, with a number of new resort destinations under consideration. The former Barbers Point Naval Air Station, now known as Kalaeloa Airport, is also an important demand generator for the military and government sector based on demand generated by U.S. Coast Guard personnel training at the airport.

The combined influence of the development and market trends noted are expected to drive the need for area housing and with it, the demand for visitors from various economic sectors in need of transient or hotel accommodations.

4.3.3 Profile of West Oʻahu Hotel Supply

New hotel development in the area includes the 175-room Hampton Inn opened at the Ka Makana Aliʻi Mall in 2016, and the 180-room Embassy Suites in 2018. Changes to Honolulu's Land Use Ordinance in 2013 made hotels with up to 180 rooms possible on Business Mixed Use-Community (BMX-3) zoned land with an approved Conditional Use Permit from DPP, where previously hotel development was generally only allowed in resort zoned locations such as Waikīkī, Ko Olina, Turtle Bay, Downtown Honolulu, and the industrial area of the Daniel K. Inouye International Airport. These new hotels are often termed “limited-service hotels” since the services provided are limited and usually do not include facilities for hotel restaurants, room service, valet, and other traditional guest services typical of full-service establishments.

Early indications for the limited-service hotel segment in Kapolei are showing that such hotels have been achieving occupancies comparable to the Oʻahu average of 84%, at average rates of $220 per night. According to Kloninger, 2019, the Hampton Inn & Suites Kapolei and Embassy Suites are receiving government/military business, primarily generated by Coast Guard personnel training at the nearby Kalaeloa Airport. The two hotels are also capturing demand from Kamaʻāina, VFR, and sports and leisure markets.

Table 4: West Oʻahu Property Profile

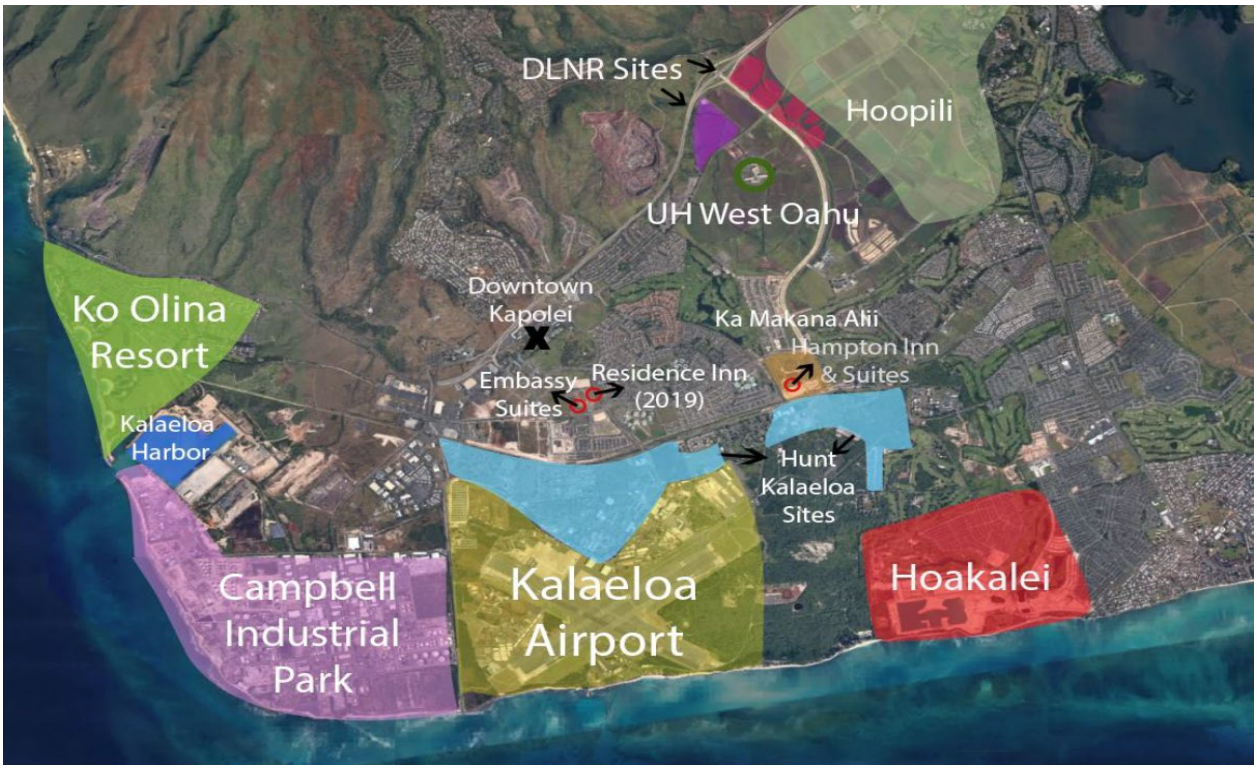
Property	Rooms	Year Open	Type	Published Rates	
				Feb 2019	Apr 2019
Four Seasons Resort Ko Olina	371	1994	Luxury Hotel	$620	$570
Marriott Ko Olina Beach Club [(1)]	918	2003	Timeshare	$321	$356
Ko Olina Beach Villas	164	2008	Luxury Condo-Hotel	$606	$500
Aulani, A Disney Resort & Spa	359	2011	Resort Hotel	$539	$509
Hampton Inn & Suites Kapolei	175	2016	Limited-Service Hotel	$212	$246
Embassy Suites by Hilton Kapolei	180	2017	Limited-Service Hotel	$212	$166

Note: (1) Timeshare property that offers unused inventory for transient rental.

Sources: Hawaiʻi Tourism Authority, Erik Kloninger Consulting, Expedia

The map below shows existing hotels in the West O'ahu region in relation to the DLNR sites, UHWO, Ho'opili, and other surrounding potential demand centers.

Figure 9: Hotels in West O'ahu



Source: Erik Kloninger Consulting, February 2019

4.3.4 Planned and Future Competitive Supply

Although the Keone'ae Station Area is considered a "…compelling opportunity for hotel development due to proximity to UHWO and Rail Station #2" (Kloninger, 2019), there is a limit to what the Kapolei area can support. Currently, there are three limited-service hotels: the 175-room Hampton Inn located at the Ka Makana Ali'i Mall; the 180-room Embassy Suites near downtown Kapolei; and the newest 180-room Residence Inn Kapolei located in the Leihano mixed-use Community. Other potential hotel sites include:

- UH West O'ahu Village – This site would generate demand from the build-out of the UHWO campus with the addition of academic programs and enrollment.
- Ho'opili – This master planned residential subdivision will have BMX-3 zoned land suitable for development.
- Ka Makana Ali'i Mall – Home to the Hampton Inn Kapolei, this regional shopping center has announced plans to add a second hotel during a later development phase.

- Hunt Kalaeloa – Hunt has initiated plans for the development of portions of land formerly under military control. A Draft Environmental Assessment for the Kalaeloa Roads project was published in February 2020 and a Final Environmental Assessment and Finding of No Significant Impact Statement is slated to be published on or before the end of 2020. This constitutes the start of infrastructure development to support future residential and commercial growth of the area. The location of Kalaeloa would be complimentary to demand generators such as nearby Kalaeloa Airport and the James Campbell Industrial Park.
- Hoakalei – Located in Ewa, this community is primarily residential development but has resort zoning for up to 950 hotel rooms.
- Ko Olina – Future development of the off-beach areas in Ko Olina Resort could include hotels considered competitive with a hotel on-site. At this time, there have been no announcements of any competitive projects at the resort, as the focus has been on building out the prime beachfront areas.
- Other TOD – The future development of hotels in the area surrounding other rail stations is possible. These hotels at nearby stations would be considered competitive to a hotel built within the Keone‘ae Station Area.

4.3.5 Success Factors for New Supply

Early indications from the performance of the three Kapolei hotels are demonstrating that it is possible to service previously unaccommodated demand for visitor/transient accommodations in the ‘Ewa/Kapolei region. Key factors that could influence the siting and successful operation of hotels in this area include:

- Continued Economic Growth in Kapolei – The growth of military, government, and business activity in the region will drive the demand for visitor accommodations. The maintenance of this growth as well as the ability to serve leisure markets will diversify the financial base of this support (see also below).
- Relationship to Demand Generators – Proximity and walking distance to major destinations such as UHWO will have a competitive advantage for capturing demand generated by the university. This is true whether the demand generator is an academic institution attracting students and faculty, or an industrial interest with frequent need of technical input and expertise from off-island specialists.
- Character of Surrounding Area – The character of the area around a hotel site should also determine whether a hotel is developed or not. Hotel sites that are part of mixed-use developments that offer dining and entertainment amenities will be more attractive than sites that do not.
- Access – Superior access to major area connector roads, H-1 or the rail line will confer advantage to potential hotel development sites.

- Brand – Access to a first-tier brand such as Marriott or Hilton, can provide a competitive advantage over independent purveyors or brands with less traction in the marketplace.
- Build out of UHWO – The build-out of the campus and new academic programs will be critical to the success of any new hotel development in the area.
- Ability to Capture Leisure Demand – O‘ahu’s hotel demand is primarily leisure-driven so the acceptance of non-resort locations by leisure visitors will help determine the pace of future hotel development in Kapolei.

5 Constraints and Opportunities

5.1 Constraints

Significant constraints for the property are related to the need to design infrastructure and the capital cost of implementation. This effort is expected to be high, requiring coordination between adjacent landowners for future UHWO and Hoʻopili development, to adequately accommodate infrastructure demands, e.g., sewer, water, and drainage demands and connections.

Vehicular circulation and access to DLNR land also require further research and coordination with HDOT, Department of Transportation Services (DTS), and local landowners, as many local roads and access points are not yet complete at the time of this report. Due to the expected volume of traffic on Kualakaʻi Parkway and Farrington Highway, as well as the need for expansion of the Farrington Highway, access and turn lanes must also be coordinated with HDOT and DTS.

Further research on land use plans and policies should be conducted to determine the full range of conditions and constraints that could limit development. These plans and policies would include but are not limited to, HRS, Chapter 343, the State's Land Use Laws, the City's General Plan and EDP, the LUO, and the East Kapolei TOD Plan.

5.2 Opportunities

DLNR lands are close to planned commercial, recreational, and residential uses, and the planned Keoneʻae Rail Station. In addition, access to major transportation thoroughfares, such as the H-1 Freeway, Kualakaʻi Parkway, and Farrington Highway, is advantageous to the project. A strong multi-modal network, including the future rail station and additional roadway connections to major thoroughfares, benefit the project.

Future rail service is expected to provide the community with connectivity to urban Oʻahu, while planned village walks, trails, sidewalks, and bicycle facilities will promote localized connectivity independent of the use of motorized vehicles. Further, the development of pedestrian and bicycle facilities would include design measures that promote safety and accessibility for all residents.

Access to the B-2 zoned lands west of Kualakaʻi Parkway, and the future Kualakaʻi Parkway West Industrial/Business Park could be coordinated with the development of an access road off of Farrington Highway.

The flat topography of the surrounding area limits views from the property, however, design concepts can take advantage of prominent mauka views of the Waiʻanae Mountain Range. In particular, significant views and vistas noted in the ʻEwa DP and offered from the property include views of Nā Puʻu at Kapolei, as well as mauka views of Puʻuokapolei, Puʻu Pālailai, and Puʻu Makakilo.

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6 CONCEPTUAL SITE DEVELOPMENT PLANS

Three alternative conceptual site plans were developed through a series of charrettes, project consultant meetings, and design meetings as a part of the project's design process. The basis for the three alternatives was the consideration of existing conditions, and the constraints and opportunities from assessing local and regional land use policies, market studies, and available infrastructure data. The outcome was the identification of a single alternative with the most potential to succeed in the current West Oʻahu real estate market.

Common elements found in all three alternatives include the following:

- Proposals for new intersections at Kualakaʻi Parkway and the east-west industrial park collector road connecting Kualakaʻi Parkway West to Kualakaʻi Parkway East, as well as at Kualakaʻi Parkway and Farrington Highway.
- A new industrial/business park located in the Kualakaʻi Parkway West area, to be subdivided into approximately 1.6- to 7-acre parcels with an additional water tank site located west of the existing water tank.
- A proposed realignment of the Hunehune Gulch in the Kualakaʻi Parkway West area to provide larger/usable land area east of the gulch.
- A 15- to 19-acre area of light industrial parcels directly adjacent to the southeast intersection of the H-1 Freeway and Kualakaʻi Parkway.
- An approximate 50.8-acre Keoneʻae Station Area, south of Farrington Highway. This area would be integrated with the proposed future HART Rail Station, including a park-and-ride area, multi-family rental units, a hotel site, as well as various retail and office space areas. This mixed-use area is intended to address critical housing needs on Oʻahu and provide synergy with State initiatives for housing and mass transit. Centering development around the future rail station allows the project to take full advantage of commuter office and retail traffic, while creating an anchor in the community to draw live, work, and play elements towards the center of East Kapolei.

Other Considerations:

The three alternatives assume an industrial/business park in the Kualakaʻi Parkway West area, but they differ with respect to development opportunities in the Kualakaʻi Parkway East and the Keoneʻae Station Area, depending on the plans for the Kaloʻi Gulch.

Rental Housing: According to Cassiday (2019), the potential rental housing demand could approach 2,110 units. However, after considering land and infrastructure constraints, the conceptual site plan would provide approximately 1,000 units. The gross building area of 661,200 square feet was calculated based on an average unit size of 950 square feet. The units would be incorporated as affordable rentals in Kualakaʻi Parkway East, and as a part of the Keoneʻae Station Area.

Drainage: Alternative 3 features the least amount of alteration to Kaloʻi Gulch and seeks to maintain existing drainage patterns for development. The natural Kaloʻi Gulch path between the proposed light industrial and affordable housing areas in Kualakaʻi Parkway East remains intact, allowing for required setbacks from both the light industrial and proposed affordable rental housing areas, as well as an approximate 80'-0" parking bay for the affordable rentals with an additional required setback to the street. The proposed Hunehune Gulch realignment through Kualakaʻi Parkway West features a roughly 100-foot realigned section with 10-foot setbacks that will drain into the future UHWO drainage.

For the Kualakaʻi Parkway West industrial park, grading will be cut and filled to minimize the slope alteration. There are two options for the grading of the lots based on topography. The first option is one large pad with 3% slope across the entire 300'-0" rough pad area, while the second option is breaking up the lot into two 3% slope pad elevations with a two to one slope buffer area between them.

Due to the development's additional impervious surfaces, detention basins or underground flood control chambers are required for each phase of development to meet storm water requirements. There are approximately 2 to 3 acres of detention basins required for each phase of development, with the detention basins at the Keoneʻae Station Area being located underground to maximize above ground site utilization for parking and mixed-use structures. For the sake of engineering calculations, the project team depicted the detention basin area for each development as one consolidated area. However, for marketability and efficiency of each project area, the team recommends spreading out the area needed for on-site water detention on an area-by-area basis, rather than locating the entire necessary detention basin area in one location.

Multi-modal and vehicular circulation: Vehicular circulation for DLNR's lands consists of roadways off Farrington Highway for Kualakaʻi Parkway West and East, including an access road connected to the land exchange with D.R. Horton, and roadways off Kualakaʻi Parkway for the makai Keoneʻae Station Area.

As a part of the overall connectivity design, the project has taken into account multi-modal forms of circulation in addition to vehicular traffic. Main north/south pedestrian and bike access would be off Kualakaʻi Parkway, with secondary access via a greenbelt trail along Kaloʻi Gulch, and additional circulation throughout the Keoneʻae Station Area interior roadways makai of Farrington Highway to activate the mixed-use development area.

Open Space: Landscape buffers are utilized around the steep topography of the industrial/business park, on the mauka and makai sides of the Kualakaʻi Parkway West development, and alongside the Farrington Highway portion of the Keoneʻae Station Area development to reduce the visual impact of the development, and emphasize the use of open space for a more aesthetically pleasing visual experience. Natural gulches, including

the Hunehune and Kaloʻi Gulches, are incorporated as part of the development in order to preserve natural open space setbacks. Neighborhood parks and open spaces will also be considered for the mixed use and residential housing developments.

6.1 Site Plan Alternatives Considered

6.1.1 Conceptual Alternative #1

A distinguishing feature of Conceptual Plan Alternative 1 is that the project would realign all parts of the Kaloʻi Gulch through the properties, and focus Kualakaʻi Parkway East on industrial uses (approximately 41 acres of light industrial), with presumed access from both Kualakaʻi Parkway and D.R. Horton's planned "Road A", as shown in Figure 10. A remnant area of the realignment could result in a somewhat linear park (approximately 3.7 acres) on the west side of the gulch. In the Keoneʻae Station Area, the gulch realignment allows maximum density with relatively large areas available for multi-family, commercial and hotel developments as well as the required park-and-ride facility. This area development extends closer to and encompasses more of the corner area at the main intersection of Kualakaʻi Parkway and Farrington Highway than other alternatives, also due to the proposed Kaloʻi Gulch realignment.

In this alternative, the industrial/business park area in Kualakaʻi Parkway West remains largely the same as the preferred alternative that is described below.

6.1.2 Conceptual Alternative #2

In Conceptual Plan Alternative 2, the Kaloʻi Gulch realignment was less extensive, with its lower portion within Kualakaʻi Parkway East realigned in order to reduce construction costs compared to Alternative #1 (Figure 11). This resulted in less developable space for the Kualakaʻi Parkway East project areas, and due to the irregular configuration of sites, areas on the eastern side of the gulch are assumed to be more suitable for residential than for industrial development. This resulted in approximately 19.6 acres shown for rental housing use, with direct access off Farrington Highway, and only 18.4 acres of light industrial land in this area. Kualakaʻi Parkway East also has a park area of about 5.1 acres.

In this alternative, the industrial/business park area of Kualakaʻi Parkway West is the same as under Alternative #1 and the preferred alternative. Also, the Keoneʻae Station Area is unchanged from Alternative #1

6.1.3 Conceptual Alternative #3

Conceptual Plan Alternative 3 features no realignment of the Kaloʻi Gulch in Kualakaʻi Parkway East. The existing alignment allows a more developable project area at the southern edge of the Kualakaʻi Parkway East on the west of the gulch, resulting in 29.5 acres of light industrial lands in this area. Kualakaʻi Parkway East would also offer 15.2 acres for rental housing development.

In the Keoneʻae Station Area, this alternative has slightly less developable areas due to the alignment of the gulch, with approximately 9.7 acres for multi-family rental uses accommodating some 720 units, and 11.4 acres of commercial/mixed use medical clinic, medical offices, and a potential hotel area makai of Farrington Highway. This option also results in 2.6 acres of prime commercial parcels at the southwest corner of the Kualakaʻi Parkway and Farrington Highway intersection (Figure 12).

Like the other two alternatives, the preferred alternative offers 44.2 acres of industrial/business park in Kualakaʻi Parkway West.

6.2 The Preferred Alternative (Conceptual Alternative #3)

The preferred conceptual development plan seeks to minimize up-front costs based on no realignment of the Kaloʻi Gulch. Alternative 3 has a lower physical impact on existing conditions with less costly development features, including avoiding or lessening the modification of existing gulches in the area, thereby reducing costs for the owner and future land developers.

Alternative 3 features the greatest strengths of all three plans while taking into consideration efficient land development strategies through optimization of existing physical topography conditions, and balanced economic market potential through a variety of proposed land uses. Alternative 3 provides the greatest optimization of land development through maximization of available land use towards industrial, light industrial, housing, and TOD oriented land uses. Not only does this maximize the plan for the highest potential of revenue generation, but it also provides flexibility for the site to anticipate and adjust to future regional growth trends in the East Kapolei Area.

6.2.1 Conceptual Land Uses

The DLNR East Kapolei Strategic Development Plan utilizes landscape buffers around the steep topography of the industrial/business park, on the mauka and makai sides of the Kualakaʻi Parkway West development, and alongside the Farrington Highway portion of the Keoneʻae Station Area development. The purpose is to reduce the visual impact of the development and emphasize open space for a more aesthetically pleasing visual experience. The presence of natural gulches, including Hunehune and Kaloʻi Gulches, are incorporated as part of the development to preserve natural open space setbacks. The open space areas shown in the plan provides flexibility for future developers to integrate into the project's overall masterplan.

6.2.1.1 Keoneʻae Station Area (Phase 1)

In each Alternative, the Keoneʻae Station Area is envisioned to fulfill the HART park-and-ride requirement south of the project site, with an adjacent hotel development just mauka. In addition to retail, office, medical office, and potential residential rental as a part of the mixed-use blocks, the configuration of the original Kaloʻi Gulch results in the Kualakaʻi Parkway and Farrington Highway intersection portions of the project being cut-off by the gulch. Although

access will require some creative thinking, this cut-off area has excellent visibility for future developers to incorporate into their overall project program (Figure 12). Due to the land swap with D.R. Horton, the south and southeastern portions of the project area can be utilized to the full block sizes bound by the proposed Road 2 and Road E.

This area is presumed to be the first phase of development due to HART's need for the park-and-ride facility and the interest in seizing commercial opportunities related to the commencement of rail service.

6.2.1.2 Kualakaʻi Parkway East (Phase 2)

In Alternative #3, Kualakaʻi Parkway East is bisected by the existing configuration of the Kaloʻi Gulch, resulting in irregularly shaped land to the east that is most likely suitable for single family and multi-family rental housing developments. Such development would also be compatible with the adjacent D.R. Horton planned community and could benefit from proximity to the planned Kapolei High School. The areas to the west of the gulch are designated for light industrial lots. Access to the project areas would be from Road A in the future D.R. Horton residential development, and direct access is provided from Farrington Highway. There could be potential right in, right out access to the site off Kualakaʻi Parkway.

This area is presumed as the second phase of development, with sequencing potentially dependent on D.R. Horton's development of the adjacent areas to provide access via Road A.

6.2.1.3 Kualakaʻi Parkway West (Phase 3)

In Alternative 3, like all three scenarios, Kualakaʻi Parkway West is designated as an Industrial/Business park, with 10.6 acres of the southeast portion of the site being transferred in the proposed land exchange with D.R. Horton. The land exchange would give D.R. Horton or the developer they choose for the project area access to the B-2 site adjacent to Kualakaʻi Parkway through a road off from Farrington Highway. The developer would be responsible for road improvements related to access off the land exchange area. As a part of this alternative, Hunehune Gulch would be modified to better align with the development of DLNR's lands. Areas that are located on steep slopes and that offer the least accessibility were chosen for the industrial/business park land use. This would provide DLNR the ability to lease smaller, irregular lots for industrial uses, and the industrial uses would generate less traffic demand.

6.2.2 Smart Growth Concepts

In 2018, the City requested technical assistance through the Environmental Protection Agency's Greening America's Communities Program to help imagine potential designs and strategies for more innovative, environmentally friendly streets and neighborhoods. Smart Growth design strategies are intended to help Honolulu achieve multiple community benefits as rail communities develop or redevelop. The designs include approaches that:

- Support economic development and public investment in transit;

- Address current and future disaster risk;
- Promote public art and placemaking;
- Better manage stormwater with green infrastructure; and
- Create streets that are safe, accessible, and usable by people of all abilities who are walking, taking transit, biking, or driving around the neighborhood.

The DLNR East Kapolei Strategic Development Plan incorporates Smart Growth concepts through supporting investment in transit with a TOD oriented mixed-use development area, providing opportunities for placemaking, creating safer/accessible streets for multiple modes of transportation, and better managing stormwater with green infrastructure where possible.

The Plan utilizes landscape buffers around the steep topography of the industrial/business park, on the mauka and makai sides of the Kualakaʻi Parkway West development, and alongside the Farrington Highway portion of the Keoneʻae Station Area. The purpose is to reduce visual impacts from construction by emphasizing open space for a more aesthetically pleasing visual experience. Natural gulches, including the Hunehune and Kaloʻi Gulches, are incorporated into the development to preserve natural open space setbacks. Neighborhood parks and open spaces are expected to be incorporated within the mixed use and residential housing developments.

Additional Water Tank Site

Ave. 100' Landscape Buffer

H-1 Freeway

Approx. 100' Landscape Buffer

Water Tank Access Easement

Light Industrial

Existing B-2 Commercial

Industrial/ Business Park

Proposed Kaloi Gulch Realignment

Light Industrial

Park

Proposed Hunehune Gulch Realignment

Proposed Culvert Crossing

Proposed Intersection (Subject to Review by TOD)

Proposed Culvert Crossing

Road A

Farrington Hwy.

Kualaka'i Parkway

Landscape/Drainage Buffer/ Road Widening

Proposed Culvert Crossing

Land Exchange (State to D.R. Horton) Approx. 11.9ac

Proposed Culvert Crossing

Multi-family Rental Units

Road B

Road A

Land Exchange (D.R. Horton to State) Approx. 11.6ac

Hotel Site

Retail/ Office/ Medical Office

Road C

Road 2

University Village 33.5 ac.

Village Green

30.9 ac.

Great Lawn

UHWO Campus Expansion

Park and Ride/ Commercial

Road N

Road "B" Transit Station

Road E

Road 1

Mixed Use Residential Emphasis

Mixed Use Commercial Emphasis

NOTE: Proposed intersections along Farrington Hwy. are subject to review by DOT.

Figure 10
Conceptual Site Plan Alternative 1

East Kapolei Lands

DLNR

North

Linear Scale (in feet)

0 400 800

Island of O'ahu

R. M. TOWILL CORPORATION

Additional Water Tank Site

Approx. 100' Landscape Buffer

Ave. 100' Landscape Buffer

H-1 Freeway

Water Tank Access Easement

Existing B-2 Commercial (± 33 ac.)

Industrial/ Business Park

Gulch Realignment

Proposed Hunehune

Proposed Culvert Crossing

Proposed Intersection (Subject to Review by TOD)

Kualakai Parkway

Light Industrial

Kaloi Gulch Original

Park

Multi-Family Rental Units

Proposed Kaloi Gulch Realignment

Proposed Culvert Crossing

Road A

Farrington Hwy.

Landscape/Drainage Buffer/ Road Widening

Proposed Culvert Crossing

Land Exchange (State to D.R. Horton) Approx. 11.9ac

Multi-Family Rental Units w/ Commercial

Land Exchange (D.R. Horton to State) Approx. 11.6ac

Hotel Site

Retail/ Office/ Medical Office

Additional Residential Rental

Park and Ride/ Commercial

Additional Residential Rental

Road B

Road C

Road N

Road E

Road 2

Road 4

University Village 33.5 ac.

Village Green

30.9 ac.

Great Lawn

UHWO Campus Expansion

Road "B" Transit Station

Mixed Use

Mixed Use Commercial Emphasis

Residential Emphasis

HIGH SCHOOL 45 acres

COUNTY PARK 1 8 acres

ELEM SCHOOL 10 acres

PARK & RIDE

NOTE: Proposed intersections along Farrington Hwy. are subject to review by DOT.

Figure 11
Conceptual Site Plan Alternative 2

East Kapolei Lands

DLNR
North

Linear Scale (in feet)
0 400 800

Island of O'ahu

R. M. TOWILL CORPORATION

Additional Water Tank Site

Ave. 100' Landscape Buffer

H-1 Freeway

Approx. 100' Landscape Buffer

Water Tank Access Easement

Gulch Realignment

Existing B-2 Commercial (± 33 ac.)

Light Industrial (+/-18.9ac)

Original Kalo'i Gulch

Rental Housing (Portion will be affordable units and done with HHFDC)

Industrial/ Business Park

(D.R. Horton pending sale)

Proposed Culvert Crossing

Proposed Intersection (Subject to Review by TOD)

Kualakai Parkway

Light Industrial (+/-10.4ac)

Multi-family Rental Units (+/-8.7ac)

Proposed Culvert Crossing

Road A

Farrington Hwy.

Proposed Huehuene

Original Gulch Alignment

Proposed Culvert Crossing

Land Exchange (State to D.R. Horton) Approx. 11.9ac

Landscape/Drainage Buffer/ Road Widening

Retail/ Office (+/-2.6ac)

Proposed Culvert Crossing

Road B

Road 4

Multi-family Rental Units w/ Commercial (+/-5.5ac)

Land Exchange (D.R. Horton to State) Approx. 11.6ac

Hotel Site (+/-3.6ac)

University Village 33.5 ac.

Village Green

Road C

UHWO Campus Expansion

30.9 ac.

Great Lawn

Road 2

Road N

Park and Ride/ Commercial Additional Residential Rental (+/-14.4ac)

Road "B" Transit Station

Road E

Mixed Use

Mixed Use Commercial Emphasis

NOTE: Proposed intersections along Farrington Hwy. are subject to review by DOT.

Figure 12
Preferred Alternative
(Conceptual Site Plan Alternative 3)

East Kapolei Lands

DLNR

North

Linear Scale (in feet)

0 400 800

Island of O'ahu

R. M. TOWILL CORPORATION

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7 Infrastructure Systems

An Infrastructure Study was completed by RMTC in February 2020 to assess the existing utility systems based on available data and provide recommended preliminary utility improvements that would be required to support the DLNR developments (See Appendix D).

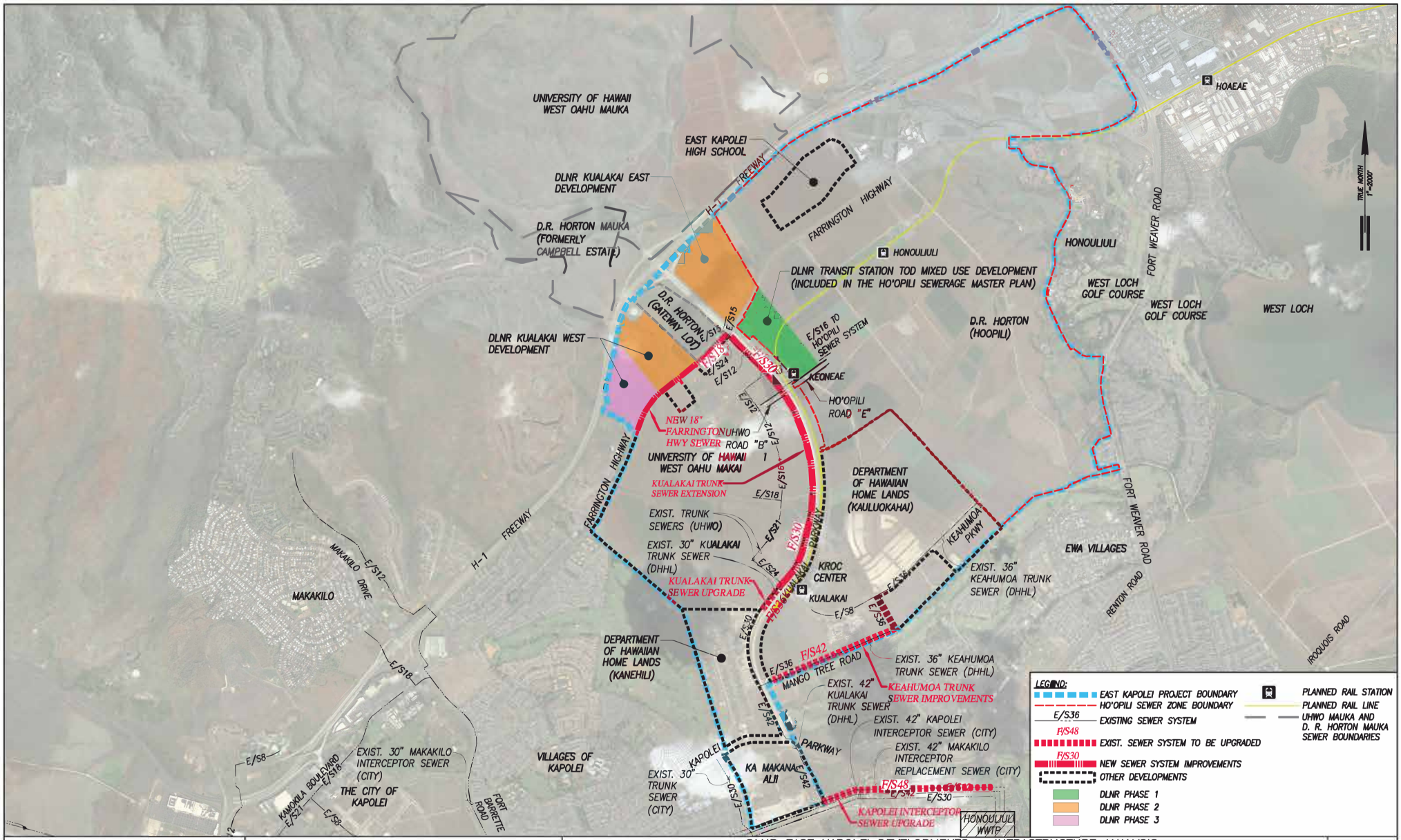
7.1 Wastewater System

Figure 13 provides a comprehensive schematic view of the wastewater masterplan for East Kapolei. Currently, the lower East Kapolei area is served by a trunk sewer main located along the Kualakaʻi Parkway (Kualakaʻi Trunk Sewer). The Kualakaʻi Trunk Sewer extends mauka from Renton Road along Kualakaʻi Parkway and terminates near the Keahumoa Parkway intersection where the Kroc Center is located. An existing sewer system within the UHWO property connects to the Kualakaʻi Trunk Sewer providing service to the UHWO campus.

In the future, the Kualakaʻi Trunk Sewer will continue mauka along the Kualakaʻi Parkway (Kualakaʻi Trunk Sewer Mauka Extension) to accommodate future development and growth in the East Kapolei area. There is no existing sewer system along Farrington Highway to service the DLNR Kualakaʻi West lands so a new 18" sewer line will need to be installed which would connect to the future Kualakaʻi Trunk Sewer Mauka Extension. Although the DLNR Kualakaʻi East lands has a 15-inch stub out and which connects to a 24-inch sewer line crossing Farrington Highway, this system lacks sufficient capacity and will need to be upgraded to accommodate the proposed development for this parcel and connect with the future Kualakaʻi Trunk Sewer Mauka Extension.

An existing 36-inch trunk sewer (Keahumoa Trunk Sewer) located along the Keahumoa Parkway and Mango Tree Road, approximately 1,400 feet makai of the Kroc Center intersection, serves the Hoʻopili development and the State Department of Hawaiian Home Lands (DHHL) developments east of Kualakaʻi Parkway. As part of the land exchange with D.R. Horton, the design of the Hoʻopili backbone sewer system incorporates the anticipated demand for the Keoneʻae Station Area ("Wastewater Master Plan for East Kapolei, Community," Community Planning and Engineering, Inc., June 2006). This will allow development of the Keone'ae Station Area without having to upgrade the Ho'opili system or having to wait for the Kualakaʻi Trunk Sewer Mauka Extension.

An analysis of sewer demands from each of the three East Kapolei conceptual alternatives was undertaken and compared against the existing Kapolei regional sewer system capacity. The results show that regional sewer system improvements, including the Kualakaʻi Trunk Sewer Mauka Extension, Keahumoa Trunk Sewer Improvements, and new 18-inch Farrington Highway Sewer lines, are necessary to support the DLNR East Kapolei developments. With the addition of the proposed sewer extension improvements, the existing regional systems would provide adequate capacities for each one of the three DLNR conceptual alternatives, and other developments from UHWO Makai, D.R. Horton, and DHHL.



R. M. TOWILL CORPORATION
Planning · Engineering · Environmental Services · Photogrammetry · Surveying · Construction Management
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3420

2000' 1000' 0 2000' 4000'

SCALE: 1" = 2000'

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS
HONOULIULI, EWA, OAHU, HAWAII

SEWER SYSTEM IMPROVEMENTS

FIGURE 13

7.2 Water System

There is no water system currently serving the DLNR East Kapolei parcels. There is an existing 2.5-million-gallon (MG) reservoir at 440 feet elevation, providing the water source for the UHWO site (East Kapolei 440' Potable System). According to the UHWO Water Master Plan, the East Kapolei 440' Potable System is also expected to be the water source for the DLNR East Kapolei parcels ("University of Hawai'i West O'ahu Water Master Plan of 440-Foot Potable Water System," Engineering Concepts, Inc., March 2007). See Figure 14, for a comprehensive overview of the potable water system. A future potable 2.5-MG reservoir next to this existing reservoir is planned to accommodate future development of the East Kapolei area. Based on our review, the new 2.5-MG reservoir can provide adequate water for the proposed developments in each of the three conceptual alternatives, based on criteria for a dual water system using potable and non-potable water.

Service to the Keone'ae Station Area would be via connection to an existing 20-inch water line at the intersection of Farrington Highway and Kualaka'i Parkway. The water source would be the East Kapolei 440' Potable System, but will require a new water line (approximately 800 linear feet) along Farrington Highway.

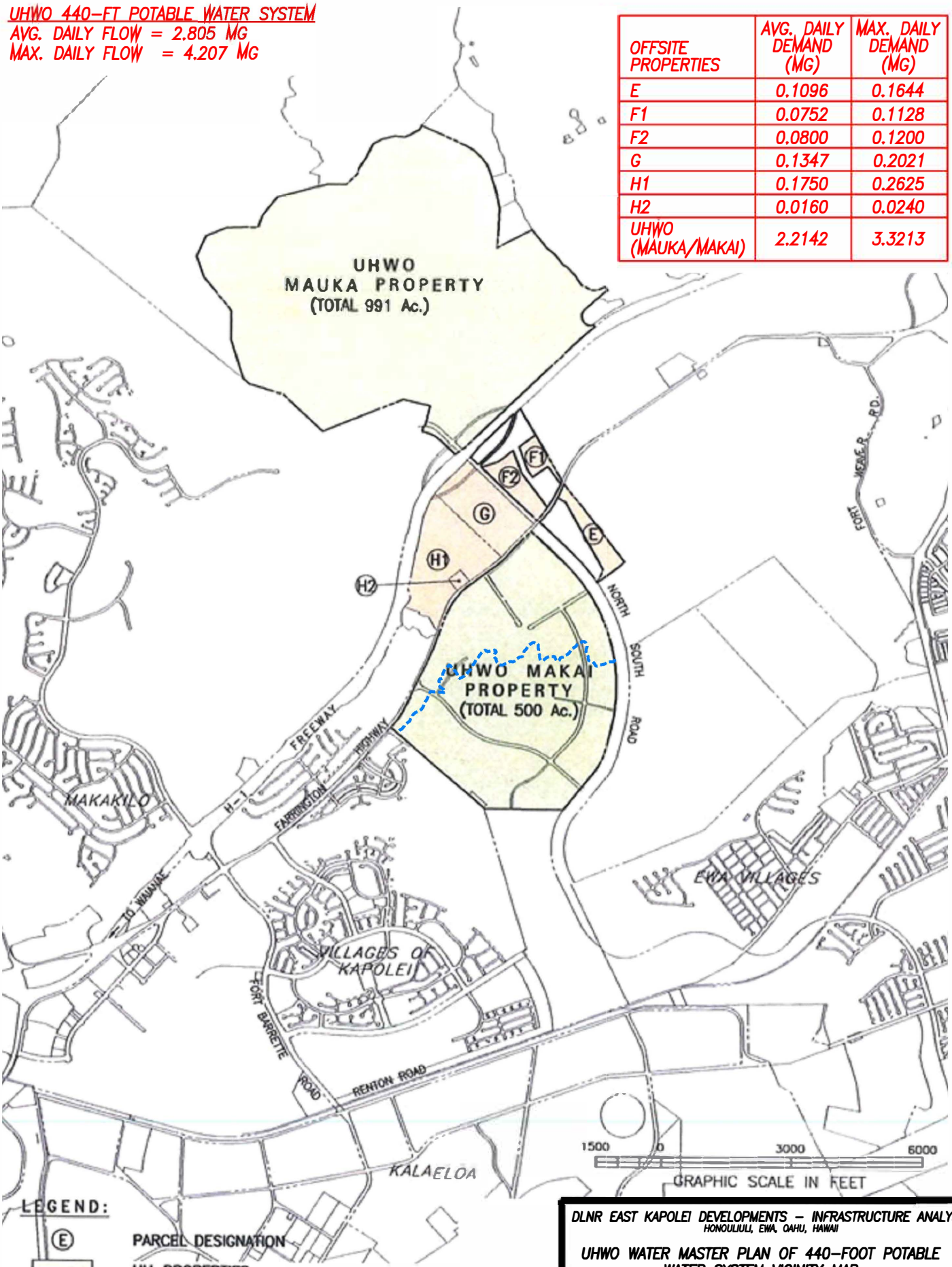
One potential option instead of constructing the 800' water line, is to seek a connection with an existing 12-inch water line at Ho'opili Road "E" which utilizes the Honouliuli Reservoir 440' Potable System. This connection will require coordination with the BWS and D.R. Horton provided that the Honouliuli Reservoir 440' Potable System has sufficient capacity to accommodate the additional demand.

A second potential option is to utilize the existing 12-inch water line for connection to the East Kapolei 440' Potable System and install a valve separating the East Kapolei 440' Potable System Reservoir 440-foot system and the Honouliuli Reservoir 440' Potable System. This second option would also require coordination with BWS and D.R. Horton.

For the Kualaka'i Parkway East and Kualaka'i Parkway West areas, the on-site water system will connect to the East Kapolei 440' System per the UHWO Water Master Plan.

UHWO 440-FT POTABLE WATER SYSTEM
AVG. DAILY FLOW = 2.805 MG
MAX. DAILY FLOW = 4.207 MG

OFFSITE PROPERTIES	AVG. DAILY DEMAND (MG)	MAX. DAILY DEMAND (MG)
E	0.1096	0.1644
F1	0.0752	0.1128
F2	0.0800	0.1200
G	0.1347	0.2021
H1	0.1750	0.2625
H2	0.0160	0.0240
UHWO (MAUKA/MAKAI)	2.2142	3.3213



SOURCE: UNIVERSITY OF HAWAII WEST OAHU WATER MASTER PLAN OF 440-FOOT POTABLE WATER SYSTEM, MARCH 2007

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS
HONOULIULI, EWA, OAHU, HAWAII

UHWO WATER MASTER PLAN OF 440-FOOT POTABLE WATER SYSTEM VICINITY MAP

FIGURE 14

7.3 Drainage System

The DLNR parcels are within the Kaloʻi Watershed, and runoff is conveyed through the Kaloʻi and Hunehune Gulches from mauka to makai through the project sites. Storm water runoff from the Kaloʻi Gulch enters Kualakaʻi Parkway East through two existing 12-foot x 12-foot box culverts at the H-1 Freeway. The flows continue south (makai) then drains towards the Keoneʻae Station Area through an existing bridge at Farrington Highway. Kaloʻi Gulch ultimately connects to the existing Kaloʻi Channel east of the Kualakaʻi Parkway. Similarly, storm water runoff from the Hunehune Gulch traverses Kualakaʻi Parkway West through an existing 96-inch pipe culvert at the H-1 Freeway and an existing bridge at Farrington Highway. The flows then continue south to UHWO.

Proposed drainage improvements at Kaloʻi and Hunehune Gulches within the DLNR parcels will serve regional and project-related requirements. Proposed improvements are summarized in Tables 5 and 6.

Table 5: Kaloʻi Gulch Drainage Improvements

Proposed Improvement	Alternative 1	Alternative 2	Alternative 3
Realignment [1]	Full realignment [2]	Partial Realignment [2]	Retain current alignment [3]
New culvert at Kualakaʻi Parkway East	Yes	Yes	Yes
New culvert at intersection of Kualakaʻi Parkway and Farrington Highway	Yes	Yes	No

1. In lieu of a concrete-lined channel, all alternatives include a grass-lined channel, which is more land intensive and reduces the developable area. However, the grass-lined design significantly reduces construction costs, which outweighs the loss of developable land area.
2. Optimizes developable area.
3. Does not optimize developable area, however, this alternative will benefit from the new Kaloʻi Gulch Bridge to be constructed as part of the Farrington Highway Improvement Project.

Table 6: Hunehune Gulch Drainage Improvements

Proposed Improvement	Alternative 1	Alternative 2	Alternative 3
Realignment [1]	Full realignment	Full realignment	Full realignment
New culvert at proposed on-site road	Yes	Yes	Yes
New bridge or culvert at Farrington Hwy	No	No	No

1. In lieu of a concrete-lined channel, all alternatives include a grass-lined channel, which is more land intensive and reduces the developable area. However, the grass-lined design significantly reduces construction costs, which outweighs the loss of developable land area.

The realignment of Kaloʻi Gulch has significant drainage cost implications. Alternatives 1 and 2 would require realignment of the Kaloʻi Gulch resulting in storm runoff diverted to a new box culvert at the intersection of Kualakaʻi Parkway and Farrington Highway. This is a large intersection with multiple turning lanes, which would require a long and costly culvert or bridge.

Alternative 3 can utilize the upgraded bridge, which would be constructed by the Farrington Highway Improvements Project before Phase 2. The realignment of Hunehune Gulch currently terminates at an existing culvert under Farrington Highway, which would also be upgraded by the Farrington Highway Improvements Project.

The increase in impervious surfaces as a result of the proposed new development and the potential for flooding requires the installation of on-site detention basins or underground chambers. This would apply to each phase of the Strategic Development Plan. HART requires 1,000 parking stalls at the future park-and-ride site near the transit station within the Keoneʻae Station Area. An underground (storm water) chamber installed under the proposed ground parking lot is a preferred option to provide more developable surface land. No structure or building would be allowed directly above the underground chambers without providing overhead clearance for maintenance. The option of constructing a detention basin in place of the more expensive underground chambers is also possible. However, this option could reduce the total developable area by approximately 2 acres (1.4 acres of light-industrial area, and 0.7 acres of residential housing area). If space is limited, a vertical parking structure may be considered to provide the required amount of parking stalls. The parking design may incorporate open spaces that provide use for detention basins. For this study, the single detention basin is assumed to be 5 feet deep with 3H:1V side slopes.

For the Kualakaʻi Parkway East area, the detention basin option will reduce the total developable area by approximately 2.1 acres (1.4 acres of light industrial area and 0.7 acres of residential housing area). For the Kualakaʻi Parkway West area, the detention basin option will reduce the total developable area by approximately 2.8 acres. The detention basins for both Kualakaʻi Parkway East and West, are assumed to be 5-feet deep with a 3H:1V side slope.

The detention basin area was calculated as one consolidated basin for each area. However, for marketability and efficiency of each parcel, the design may include open spaces that can be used as detention basins. Thus, the project team recommends that during the design process, DLNR considers distributing the area necessary for on-site water detention on a parcel-by-parcel basis, instead of locating the entire detention basin area in one location. The final layout and size of the detention basins or underground chambers will be determined during the design phase of each parcel.

7.3.1 Storm Water

The City's "Rules Relating to Water Quality" guidelines apply to all development and land-disturbing activities within the City and establish minimum requirements for use of Best Management Practices (BMPs).

Based on the rules, the DLNR project would be classified as a Priority A project and a Storm Water Quality Report (SWQR) must be submitted to the City Department of Planning and Permitting (DPP) for review and approval prior to the issuance of any building, grading, grubbing, and/or stockpile permit for development.

Post-construction treatment control may include BMPs for retention, biofiltration, and alternative compliance. The location and method of the post-construction treatment control BMPs will be determined during the design phase.

For retention BMPs, detention basins or underground chambers can be used for both flood control and storm water quality purposes, provided that the soil infiltration rate meets the minimum requirement of 0.5 inches per hour, and the ground water table is below the detention basin and invert of the underground chambers. As described for detention basins, open spaces available for detention can be spread out on a parcel-by-parcel basis.

7.4 Roadway Systems

Kualakaʻi Parkway and Farrington Highway are two major regional roadways that traverse the DLNR East Kapolei Lands. Kualakaʻi Parkway is a divided State highway with a raised median connecting the H-1 Freeway and Kapolei Parkway. The City owns the portion of the two-lane Farrington Highway (one lane in each direction) between the Kapolei Golf Course and Fort Weaver Road.

The City and HDOT are in the planning and design stages for the Farrington Highway Widening Improvements Project, and an HRS, Chapter 343, Final Environment Assessment (FEA)Finding of No Significant Impact (FONSI) is expected before the close of the 2020 calendar year. The Farrington Highway widening is expected to proceed in two phases and would widen the highway to four lanes (two lanes in each direction), with the potential for six lanes in the future, if warranted. Additional project areas are unspecified, as agreements with DTS and HDOT are subject to review and approval. The final location and width of the right-of-way (ROW) width (up to 140-feet) will determine the northern boundary of the Keoneʻae Station Area.

HDOT will require a Traffic Impact Analysis Report (TIAR) for the project to evaluate the potential for regional traffic impacts. Potential roadway improvements may include the construction of major intersections in the vicinity of the project sites that would serve regional and project-related purposes. There is the potential for improvements to four intersections; however, the final locations are subject to change:

- Farrington Highway connecting to the proposed on-site roads in the Keoneʻae Station Area and Kualakaʻi Parkway East. This intersection is currently under review with HDOT to determine if it can be included in the first phase of the Farrington Highway Widening Improvement Project.
- Kualakaʻi Parkway connecting to the proposed on-site roads in Kualakaʻi Parkway East - D.R. Horton is currently working with the HDOT to improve the western portion of the

intersection to a signalized T-intersection. However, HDOT requires the T-intersection configured as right-in/right-out if projections for traffic conditions impact future traffic flow on the H-1 Freeway. Any developments involving Kualakaʻi Parkway must, therefore, be coordinated with HDOT during the design phase to determine the scope of the intersection improvements.

- Two intersections along Farrington Highway connecting to the proposed on-site roads in Kualakaʻi Parkway West - The east intersection would connect the DLNR proposed on-site roads to the UHWO master-planned on-site roads. The west intersection is to provide additional access to the parcel from Farrington Highway. The final locations of these intersections will be coordinated between DLNR and the City.

7.5 Electrical and Communication Systems

The Hawaiian Electric Company (HECO) is the main supplier of electricity on Oʻahu. Most of the island's power is generated by plants located on the west side of the island and delivered through 138 kilo-Volt (kV) transmission corridors, and then from transmission and distribution substations to utility customers. In general, a distribution system consisting of a blend of underground electric utility lines and overhead utility lines supported by wood joint poles serve the East Kapolei TOD area. HECO also has several overhead lines through the district that are part of their regional transmission and sub-transmission systems. These regional facilities interconnect HECO substations interspersed throughout the island of Oʻahu. Hawaiian Telcom and Spectrum also provide telecommunications services via these overhead and underground lines.

In the future all TOD areas will be part of the TOD Special Districts and new electric and telecommunications facilities will be required to be installed underground (ROH, Chapter 22). Existing overhead facilities installed prior to the addition of a station area to the TOD Special District may remain overhead and, if necessary, may be repaired and supplemented if such actions do not alter the character of such lines

HECO presently serves the residential, commercial and governmental customers in the East Kapolei TOD area from their 12-kV distribution system. The power sources for the 12-kV system are HECO's existing Kaloʻi, Kapolei, ʻEwa Nui, and Kamokila Substations. HECO is currently planning to construct a new substation, Hoʻopili Substation Site No. 2 and has a parcel near the existing Kroc Center which can be developed into the East Kapolei Substation. Additional tentative substation locations have been identified for the future development of Hoʻopili Substation Sites Nos. 1 and 3, both within the Hoʻopili Development, and one additional substation site located within the University District Lands parcel.

For new developments, Hawaiian Telcom and Spectrum typically require developers to provide underground telecommunications duct system infrastructure ("support structures") but will provide the cabling at their cost. In the most common scenario, the cost of new electrical facilities that are triggered by specific development projects, while nominally the responsibility of HECO, are paid for with funds provided by the developers of projects requesting service. These funds consist of a refundable advance and a non-refundable contribution with the advance portion

covering the cost of an "equivalent" overhead system and the non-refundable contribution reflecting the cost difference between an overhead system and an underground system. Over a 10-year period after construction of such projects, HECO reimburses, on a year-by-year basis, the project developers for a sum equivalent to the electricity usage charges paid by the energized development during that year for the advance portion only. Another process, Community-Funded Development, is being contemplated, but the cost sharing formula and funding mechanisms are still being developed.

The improvements proposed in this section focus primarily on electrical capacity because current telecommunication technology generally allows Hawaiian Telcom and Spectrum to provide additional capacity to accommodate growth without new infrastructure.

The necessary electrical improvements identified by the analysis of the East Kapolei TOD area are to increase the quantity of existing 12-kV distribution lines extending from existing or proposed distribution substations, provide additional 46-kV transmission line extensions for the proposed substations, and develop additional distribution substations. For the DLNR parcels the on-site improvements include new electrical and communications infrastructure. The new above-grade 46-kV infrastructure is a system cost borne by HECO but the undergrounding of existing 46-kV infrastructure, if requested by a private party generally to improve its development, will need to be negotiated with the State and the City with the cost of the undergrounding borne by the requesting party.

7.6 Infrastructure Cost Estimates

The rough order-of-magnitude (ROM) infrastructure costs to support the three DLNR East Kapolei development alternatives are divided into three categories as follows:

- Regional improvements: Improvements that will provide benefits and enhancement to the region, not just for the specific project.
- Regional/project improvements: These are improvements consisting of onsite and/or offsite improvements that are required to support the project needs
- Project improvements: These are typical on-site improvements consisting of backbone roadway, drainage, sewer, water, landscape, electrical, storm water quality, and other ancillary developments.

The infrastructure costs (2019 dollars), not including building, demolition, and soft costs, are summarized in the Infrastructure Study (included as Table 6 in the study, and a detailed breakdown is also appended to the study). As shown in Section 8, Table 8 of the Infrastructure Study, the infrastructure costs for Alternative 1, Alternative 2, and Alternative 3 are $214.1 million, $213.9 million, and $194.6 million, respectively. It should be noted that the costs of the regional/project sewer improvements and regional water improvements will have to be negotiated and shared among the developers whose developments impact the regional system. The same is true for the proposed upgrade to the HECO 46 kV Underground Duct System.

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8 Economic and Fiscal Impact Assessment

Colliers International Hawaii (Colliers Hawaii) was engaged by RMTC to study the economic impact resulting from the development of the DLNR Lands. Based on the demand studies, the analysis focused on the future development of the residential, commercial, industrial and hotel uses on DLNR's land. The analysis is based on the estimated developable area/gross floor areas for Alternative 3, the preferred site plan, which is shown in Table 7 below, and includes the following:

- Econometric model creation (model depicts the flow of capital, job creation (during construction and stabilized operations), probable number of patrons, on and off-site expenditures of workers and patrons).
- Identification of secondary impacts and their Influence on economic returns.
- Forecasts for tax revenues (project vs. public costs/services) and is a basic measure of whether a project may constitute a surplus of tax benefits accruing to the government, a deficit or liability of public costs to provide infrastructure, or a break-even where taxes and user fees may off-set the cost of providing public services.

Table 7: DLNR East Kapolei Lands Conceptual Plan Summary

Land Use	Developable Area/Gross Floor Area			Notes	Potential Mkt. Demand by 2039 (1)	Econ. Impact Analysis (2) (2020 - 2039)
	Kualaka'i Parkway West (70.5 acres)	Kualaka'i Parkway East (58.4 acres)	TOD Mixed Use (50.7 acres)			
Multi-family Rental		266,000 sf 280 units	684,000 sf 720 units	3- to 4-story bldg. & 7- to 8-story bldg. Avg unit size: 950 sf	2,110 units	1,000 units
Retail			50,000 - 64,000 sf	2-story w/upstairs office space 1- or 2-story in Park-and-Ride Area	120,000 sf - 168,000 sf	114,000 sf
Office			20,000 sf	Upstairs office	16,000 sf - 24,000 sf	20,000 sf
Industrial	37.6 acres	25.1 acres		Estimated bldg. area: 1.04 million sf	24 acres - 48 acres	48 acres
Hotel			144,000 sf 180 rooms	5-story bldg.	180 rooms	180 rooms

(1) Conservative to aggressive range (rounded) based on Kloninger (Kloninger, 2019). There may be additional demand beyond 2039.
(2) Potential additional demand beyond 2039 was not addressed by the Colliers Hawaii study.

Source: Colliers Hawaii, 2020

Methodology

The methodology employed by Colliers Hawaii is based on estimating the major economic contributions from the development of apartments, retail centers, office buildings, industrial buildings, and hotels on the DLNR East Kapolei lands. Each of these proposed land uses result in economic impacts that were further subject to analysis based on the following:

Input-Output Study – The economic impacts from developing the various land uses were formulated based on data from the input-output (I-O) tables in the State's Department of Business, Economic Development & Tourism's Hawai'i State Input-Output (I-O) study (2012). The multipliers from the I-O tables formed the basis for estimating output, income, and employment.

Timing – The study spanned a 20-year timeframe, from January 1, 2020 through December 31, 2039. The baseline year is 2019 and the year-by-year summary was adjusted by 3.0% annually to account for price adjustment and inflation.

Economic Impacts – Economic growth is primarily from the operation of the planned buildings slated for construction. Construction of the buildings is considered a significant but temporary impact that would generally last for only the duration of construction. The operation of the buildings is therefore considered a permanent impact that is projected upon the completion and occupation of the buildings. The specific economic factors considered include:

Construction:

- Construction Costs - Direct output, plus indirect & induced impacts
- Employment & Wages - Direct output, plus indirect & induced full-time equivalent (FTE) employment and earnings
- Tax Revenues – General Excise Tax (GET) and income taxes from direct outputs

Operations

- New Consumer Spending (retail) - Direct output, plus indirect & induced impacts
- Building Operating Costs - Direct output, plus indirect & induced impacts
- Employment & Wages - Direct output, plus indirect & induced FTE employment and earnings
- Tax Revenues – GET, Transient Accommodations Taxes (TAT) and income taxes from direct outputs

8.1 Economic and Fiscal Impacts of Preferred Alternative 3

8.1.1 Construction

The total economic effect from direct and secondary construction impacts for the period 2020 through 2039 is summarized as follows, in 2019 dollars:

- Output $2.8 billion
- Employment FTEs 5,104 persons
- Employment Wages $603.4million
- State Fiscal Impacts $28.2 million

A detailed tabular representation of this data is provided below:

Table 8: Total Construction Economic and Fiscal Impacts (2019 dollars, 000s)

Period	2020-2024	2025-2029	2030-2034	2035-2039	Totals
Output					
Construction Costs	$332,543	$226,487	$220,866	$132,312	$912,209
Indirect & Induced	$698,252	$475,563	$463,761	$277,820	$1,915,395
Totals	$1,030,795	$702,050	$684,627	$410,132	$2,827,604
Employment & Wages					
Construction FTEs	1,057	523	1,057	863	3,501
Indirect & Induced FTEs	577	249	465	312	1,603
Totals	1,634	772	1,522	1,175	5,104
Construction Wages	$72,669	$29,999	$65,979	$43,494	$212,140
Indirect & Induced	$134,024	$55,327	$121,685	$80,217	$391,254
Totals	$206,692	$85,326	$187,664	$123,711	$603,394
Fiscal Impacts to State					
GET	$1,663	$1,132	$1,104	$662	$4,561
Income Taxes*	$9,311	$6,342	$4,406	$3,463	$23,521
Totals	$10,974	$7,474	$5,510	$4,124	$28,082

* Direct output FTEs

(Source: Colliers Hawaii, 2020)

Colliers Hawaii presents the estimated economic and fiscal impacts of construction activities by land use as detailed below:

Table 9: Construction Economic and Fiscal Impacts by Land Use (2019 dollars, 000s)

Land Use	Multi-family	Retail	Office	Industrial	Hotel	Totals
Output						
Construction Costs	$503,392	$39,338	$16,041	$257,643	$95,794	$912,209
Indirect & Induced	$1,056,989	$82,600	$33,681	$540,982	$201,143	$1,915,395
Total	$1,560,381	$121,938	$49,722	$798,626	$296,937	$2,827,604
Percent of Total	55%	4%	2%	28%	11%	100%
Employment & Wages						
Construction FTEs	1,269	242	38	1,690	262	3,501
Indirect & Induced FTEs	692	130	20	621	140	1,603
Totals	1,961	372	58	2,311	402	5,104
Construction Wages	$87,188	$26,654	$2,600	$71,683	$24,016	$212,140
Indirect & Induced	$160,801	$49,152	$4,800	$132,206	$44,295	$391,255
Totals	$247,989	$75,806	$7,400	$203,888	$68,311	$603,394
Fiscal						
GET	$2,517	$197	$80	$1,288	$479	$4,561
Income Taxes*	$14,095	$1,101	$207	$7,214	$904	$23,521
Totals	$16,612	$1,298	$287	$8,502	$1,383	$28,082

* Direct output FTEs
(Source: Colliers Hawaii, 2020)

8.1.2 Operations

Operational impacts are the long-term result of the construction of buildings and facilities on the DLNR East Kapolei lands, presented for each five-year interval between 2020 through 2039. Colliers Hawaii summarizes the total economic and fiscal impacts of direct and secondary operations as follows:

- Output $1.6 billion annually
- Employment FTEs 2,390 persons
- Employment Wages $1.8 billion annually
- State and County Fiscal Impacts $126.6 million annually

Table 10: Total Operational Economic and Fiscal Impacts (2019 dollars, 000s)

Period	2020-2024	2025-2029	2030-2034	2035-2039	Totals
Output					
Retail Spending			$75,464	$153,127	$228,591
Induced & Indirect			$141,234	$329,639	$470,873
Totals			$216,698	$482,766	$699,464
Building Operations	$5,940	$36,003	$105,891	$147,061	$294,895
Induced & Indirect	$12,153	$73,713	$217,107	$304,576	$607,550
Totals	$18,094	$109,715	$322,999	$451,637	$902,445
Total Output	$18,094	$109,715	$539,697	$934,403	$1,601,909
Employment & Wages					
Building Tenants FTEs		331	1,298	2,196	3,825
Building Operations FTEs	7	10	109	118	244
Indirect & Induced FTEs	13	17	54	76	160
Totals	20	358	1,462	2,390	4,230
Building Tenant Wages		$35,766	$409,653	$899,336	$1,344,755
Building Operations	$381	$2,256	$100,494	$219,001	$322,133
Indirect & Induced Wages	$681	$4,029	$52,861	$88,552	$146,123
Totals	$1,062	$42,051	$563,008	$1,206,889	$1,813,010
State and County Fiscal					
GET	$622	$3,895	$20,951	$33,748	$59,216
Property Taxes	$1,374	$8,798	$22,419	$34,789	$67,381
Income Taxes *	$127	$1,988	$15,196	$32,363	$49,673
Totals	$2,123	$14,681	$58,566	$100,900	$176,270

* Direct output FTEs

(Source: Colliers Hawaii, 2020)

Colliers Hawaii represents this same information tabulated by land use for the duration from 2020 and ending in 2039 as follows:

Table 11: Total Operational Economic and Fiscal Impacts by Land Use (2019 dollars, 000s)

Land Use	Multi-family	Retail	Office	Industrial	Hotel	Totals
Output						
Retail Spending		$228,591				$228,591
Induced & Indirect		$470,873				$470,873
Total	$0	$699,464	$0	$0	$0	$699,464
Building Operations	$154,034	$17,508	$1,255	$23,147	$98,951	$294,895
Induced & Indirect	$315,152	$38,636	$2,530	$48,779	$202,453	$607,550
Totals	$469,186	$56,144	$3,785	$71,926	$301,404	$902,445
Total Output	$469,186	$755,608	$3,785	$71,926	$301,404	$1,601,909
Employment & Wages						
Building Tenants FTEs		$255,381	$49,411	$1,089,373		$1,394,165
Building Operations FTEs	$9,884	$12,858			$5,839	$28,581
Indirect & Induced FTEs	$17,651	$14,142			$12,115	$43,909
Totals	$27,535	$282,381	$49,411	$1,089,373	$17,954	$1,466,655
Building Tenant Wages		$255,381	$49,411	$1,089,373		$1,394,165
Building Operations	$9,884	$12,858			$5,839	$28,581
Indirect & Induced Wages	$17,651	$14,142			$12,115	$43,909
Totals	$27,535	$282,381	$49,411	$1,089,373	$17,954	$1,466,655
State and County Fiscal						
GET	$14,360	$17,366	$216	$9,684	$17,589	$59,215
Property Taxes	$35,634	$7,523	$732	$18,273	$5,219	$67,381
Income Taxes*	$3,288	$3,855	$1,709	$37,681	$3,140	$49,673
Totals	$53,282	$28,744	$2,657	$65,638	$25,948	$176,269

* Direct output FTEs

(Source: Colliers Hawaii, 2020)

A general observation from the economic impacts associated with development is there are immediate construction benefits from expenditures for construction labor, the purchasing of building materials, and professional services and other expenses such as survey, engineering, and specialty disciplines for the design and permitting process generally required prior to the start of construction. The total short-term expenditures generated for all projects associated with the development of the DLNR East Kapolei lands will be significant and would have a ripple effect within the economy from the infusion of approximately $2.8 billion in total output.

The long-term result from the operation of facilities and buildings that are developed will also be significant, as articulated for the approximately 20-year time horizon from 2020 to 2039. The project's ongoing economic impact could represent an additional $1.6 billion for the economy, while providing for 2,390 full-time equivalent employee positions.

The following summarizes the economic impact findings of each of the specific sectors under study by Colliers Hawaii (see Conceptual Plan Alternative 3, East Kapolei Lands, which provides the land use summary for the Kualakaʻi Parkway West, Kualakaʻi Parkway East, and Keoneʻae Station Area).

8.2 Residential Findings

The Residential Rental Market Study for the DLNR East Kapolei Lands finds that there is an average annual demand of 162 units per year from 2023 to 2035. The study projects 720-units at the Keoneʻae Station Area would be built first and delivered in 2024 after the rail is assumed to be operating. The second increment of 280 units would be delivered five years later in 2029.

The estimated economic impact from development of the two affordable rental projects (1,000 units) on the DLNR East Kapolei lands would bring an estimated $484.5 million to the economy in 2019 dollars in the period 2022/2023 and 2027/2028. Secondary impacts from indirect and induced effects of construction are projected to yield another $1.0 billion in economic output.

The construction of the two rental projects could create approximately 2,140 direct jobs during development, with an additional 1,170 indirect and induced jobs. Taxes and fees generated from development could account for approximately $16.0 million of GET and income taxes generated with the residential apartment construction. This includes $2.4 million in GET from rental revenues and $13.6 in income taxes.

The total economic impact from developing the two affordable rental projects is estimated at $1.9 billion from construction and $26.4 million annually from operations, in 2019 dollars. Job creation includes 2,140 direct FTE jobs, 1,170 indirect and induced jobs from development and construction, and 10 permanent FTEs from operations.

8.3 Retail Findings

The 2020 retail study indicates there is moderate market demand to support up to 146,000 square feet of retail space on DLNR's lands by 2039. The conceptual site plan presents 114,000 square feet of total retail space in two buildings in the Keone'ae Station Area. There is an estimated 50,000 square feet of retail space in one commercial building bordered by Roads 2, N, and C, and approximately 64,000 square feet in a one to two story building on the park-and-ride lot. Final site configuration of the Keone'ae Station Area will likely be determined by the future developer for the site. The impact of this and other retail inventory was not analyzed by Colliers Hawaii as the projected retail demand was minimal within the timeframe for the delivery of the affordable rental units in the area.

The 2020 Colliers Hawaii study estimates that a new retail center would generate retail sales in the range of $425 to $525 per square foot. Colliers Hawaii's projections assume a mid-range of $475 per square foot or $51.4 million per year in 2019 dollars. However, only a portion of these sales are a direct output into the economy as there is a wholesale margin to account for. Based on the margins from the 2012 I-O study, retail and transportation margins as a proportion of retail prices results in an estimated $23.5 million in direct additional expenditures in the state.

Colliers Hawaii finds there is no new projected retail demand at this location until 2029, but up to 109,000 square feet thereafter, through 2034. Additional demand of up to 58,000 square feet is projected from 2034 to 2039. The basis for this assessment is that the proposed park-and-ride retail center would be built first and delivered in 2031 and the other TOD center would be delivered in 2036.

The economic impact from construction of the two retail centers is an estimated $17.4 million in the 2029/2030 and 2034/2035 time horizons. Indirect and induced economic effects are projected to yield $264.2 million in new spending.

The construction of the two buildings could create 242 FTE jobs and approximately 130 indirect and induced jobs. Approximately $4.5 million of GET on construction costs and $1.5 million in income taxes could be generated from retail center development.

The total economic impact from developing two retail center properties is estimated at $222.9 million from construction and $19.6 million annually from operations ($2019). Jobs creation includes 372 FTE jobs from construction and 284 FTE jobs from operations.

8.4 Office Findings

Office business revenues are difficult to estimate due to the diverse types of businesses that occupy office spaces. The Colliers Hawaii's study focuses on typical office rents and operational expenditures to determine the economic impact of developing and operating an office building.

Office rents are typically comprised of a base rent and operating expense recovery. The current average market base rent for Kapolei office space is between $2.00 and $3.00 per square foot (psf)/month (mo). New developments would likely be in the upper end of this range. At $3.00 psf/mo, base rent revenue is equal to $684,000 per year.

Operating expenses include utilities, janitorial, maintenance and related services. This amounts to approximately $1.25 psf/mo or approximately $300,000 annually.

Demand for office space, particularly at this location, is projected to be minimal over the next 20 years, with only 23,653 square feet expected to be required through 2039. Development of office space is projected to coincide with retail/commercial development in the Keoneʻae Station Area in the 2035 timeframe. The conceptual plan for DLNR includes 20,000 square feet of general office and medical office space located on the second floor of the commercial building at the Keoneʻae Station Area.

When the new office space is scheduled to be developed, it is estimated to bring approximately $8.6 million to the economy with indirect and induced impacts of about $18.0 million.

The new construction will create an estimated 38 FTE jobs with approximately 20 induced and indirect jobs added. Construction is expected to add approximately $2.6 million ($2019) in new earnings/direct income. Approximately $43,000 in GET and $207,000 in income taxes are projected to be generated annually.

The total estimated economic impact from developing office space is $26.6 million from construction and $8.2 annually from operations, in 2019 dollars. Projected job creation includes 106 FTE from construction and 127 FTE from tenant operations.

8.5 Industrial Findings

The industrial market study indicates there is demand for up to 47.9 acres of the 62.7 acres of DLNR East Kapolei industrial lands in the 2024 to 2039 timeframe. This equates to an over 1.04 million square feet of industrial building area, assuming a 0.5 floor-area ratio (FAR). Additional demand beyond 2039 to fill the remaining 14.8 acres is possible but was beyond the scope of the 2020 Colliers Hawaii study.

Industrial rents are typically comprised of a base rent and operating expense recovery. The average market base rent for Kapolei warehouse space was estimated at $1.33 psf/mo in 2019, however, a new development is likely to command rents above the average rate. At $1.40 psf/mo, base rent, projected project revenue was estimated at $16.6 million per year at full buildout, in 2019 dollars.

Operating expenses are lower than office/retail as industrial uses generally have less common area to maintain. Expenses include utilities, maintenance and repair, professional services, real property taxes, and insurance. The then-current market average for operating expense rates was $0.36 psf/mo or about $4.28 million annually.

Colliers estimates development of the industrial lands could generate $175.3 million ($2019) to the economy over a 20-year period. Indirect and induced impacts could add another $337.4 million in new spending.

Construction employment would result in approximately 709 FTE jobs, plus approximately 390 indirect and induced jobs. This would result in up to approximately $48.8 million in new earnings and wages. GET could amount to $803,000 and income taxes of approximately $1.3 million would be generated from industrial warehouse development.

The total estimated economic and fiscal effect from the development of new industrial buildings at DLNR's East Kapolei lands could amount to $787.8 million from construction and $616 million annually from operations, in 2019 dollars. Jobs creation would amount to 1,924 FTE jobs from construction and 1,881 jobs from tenant businesses. The projected fiscal impact is $1.4 million in GET and income taxes from construction, and $1.8 million annually from new property taxes and operations.

8.6 Hotel Findings

According to Kloninger's 2019 study, there was market demand for two, 180-room hotels over the next 20-year time horizon. The proposed conceptual plan provides for at least one 180-room hotel in the Keoneʻae Station Area along Kualakaʻi Parkway.

The development of a new 180-room hotel is projected to bring up to approximately $71.3 million (2019 value) to the economy. Indirect and induced impacts could result in another $124.7 million being spent.

Construction could generate approximately 262 FTE jobs and approximately 400 indirect and induced FTE jobs. This would result in approximately $17.9 million in new earnings and direct income. Approximately $921,000 of GET and $500,000 in income taxes would also be generated.

The total estimated economic effect from the development of a new hotel would amount to $236.4 million from construction and $35 million annually from operations, in 2019 dollars. Job creation includes 402 direct and indirect and induced FTE jobs from construction and 106 jobs from operations.

9 Constraints, opportunities, and other considerations

9.1 Constraints

Generally, the major constraints associated with implementing the development plan are related to infrastructure and the costs for implementation. In addition, early coordination will be required between adjacent landowners for future UHWO and Hoʻopili developments in order to effectively accommodate sewer, water, and drainage demands and connections for the DLNR East Kapolei lands.

Vehicular circulation and access for DLNR lands will also need further evaluation and coordination with HDOT, DTS, and local landowners, as many local roads and access points have not been constructed at the time of this report. Due to the volume of traffic to be accommodated on Kualakaʻi Parkway and Farrington Highway, as well as pending expansion of the latter, access and turn lanes will also require coordination with HDOT and DTS as well.

Land use conformance, easements, and other development restrictions also need to be taken into consideration. For example, the proposed development plans being evaluated all have identified uses that does not conform to the current underlying zoning but would be allowed under the East Kapolei Neighborhood TOD plan currently under review by the City. Adoption of the plan will allow DLNR to proceed with its long-range planning and development for the area. Further research should be conducted to ensure compliance with applicable policies and determine if there are any conditions on the property due to the various regulatory documents including the State Environmental Review Law, State Land Use Law, City General Plan, the ʻEwa DP, the City LUO, and the East Kapolei TOD Plan.

9.2 Opportunities

DLNR's lands are located close to planned commercial, recreational, and residential uses, and the Keoneʻae Rail Station. In addition, access to major transportation thoroughfares, such as the H-1 Freeway, Kualakaʻi Parkway and Farrington Highway, will be advantageous to the project. A strong multi-modal transportation network, including the future rail station and additional roadway connections to major thoroughfares, provides the project areas with a substantial benefit.

Future rail service will connect the community to urban Oʻahu, while the village walks, sidewalks and bicycle facilities will help promote localized connectivity that is not dependent on vehicles.

Views from the property are limited due to the flat topography, however, design concepts can take advantage of prominent mauka views of the Waiʻanae Mountain Range. In particular, significant views and vistas noted in the ʻEwa DP and offered from the property include views of Nā Puʻu at Kapolei, as well as mauka views of Puʻuokapolei, Puʻu Pālailai, and Puʻu Makakilo.

9.3 Additional Considerations

DLNR will pursue opportunities to partner with private developers and other public agencies to implement the project. In addition, further refinement and development of its long-range plans will provide opportunities to thoroughly evaluate all environmental and socio-economic impacts. Regulatory, permitting, and funding requirements to implement the project.

Land use conformance, easements, and other development restrictions also need to be taken into consideration. For example, the preliminary land use program proposes uses and heights not permitted under the current LUO. Adoption of the East Kapolei Neighborhood TOD Plan by the City would allow development flexibility and DLNR's plans to proceed.

In addition, the project's estimated infrastructure demands are based on current design standards. Depending on the final development plans, the requirements may differ from the current proposals. Preliminary designs must be submitted at the time of permitting to determine sewer and water availability. The final design will require the review and approval of the HDOT, DPP, Department of Design and Construction, and utility agencies and organizations such as the BWS and HECO.

Being essentially greenfield, the main constraints associated with developing the land are related to infrastructure. The lack of adequate water, drainage, roadway and sewer capacity and the costs for implementation, present significant challenges to development. Additional coordination will be required between adjacent landowners for future UHWO and Hoʻopili developments in order to adequately accommodate sewer, water, and drainage demands and connections. In particular, while the addition of proposed sewer extension improvements is expected to provide adequate capacities for DLNR lands, as well as other proposed area developments, some capacity may need to be reallocated from the UHWO's Mauka property.

Vehicular circulation and access for all DLNR lands also requires further coordination with State and County agencies and local landowners, as many local roads and access points have not been constructed at the time of this report. Community relations and previously designed elements in the Kapolei region should be recognized. In particular, the residents in the region may have concerns regarding "affordable rentals", so messaging will be important. Further, a robust community outreach program will also be required to properly vet the concepts and potential implications with residents, key stakeholders, elected officials, and the community at-large.

9.4 Study Context and Potential Impacts of the COVID-19 Pandemic

This report was drafted between November 2019 and August 2020, with reference to consultations, data collection, and analyses conducted between the third quarter of 2018 and the third quarter of 2020. From approximately February 2020, the COVID-19 pandemic caused major economic, social, and business disruptions in Hawaiʻi, as it did worldwide. At the time of this writing, little data exists on the pandemic's impacts on development markets and financing, and the timing of recovery is uncertain.

The development visions presented herein reflect the long-term goals and aspirations of the DLNR for its holdings in East Kapolei. Some of the projects described would not be expected to materialize for years or even decades of this study. The assessments presented in this report are tied to future implementation of the desired projects, and while some could be delayed, for purposes of this study, it is assumed that in this longer-term framework, conditions affecting such development in Hawai‘i could have recovered to be within the range of outcomes described herein. Nevertheless, prior to implementation of any particular project, as for any development, the conclusions presented herein should be reviewed in the context of then-current market, economic, fiscal, political, and social environments.

9.5 Report Conditions and Use

This document presents site analyses and preliminary development concepts for DLNR’s East Kapolei Lands. The effort was guided by the study purposes noted above, and by DLNR’s mission and vision for lands, site and environmental conditions, market and development observations (prior to the initiation of rail service), and the team’s long-standing experience in TOD planning and development on O‘ahu and elsewhere. However, since DLNR does not intend to serve as developer, but rather may seek developer(s) and/or ground lessee(s), the goals, market environment and other factors relevant at such future time may be different than what are currently envisioned, and this could result in different development concepts and conclusions.

Accordingly, the assessments presented herein are based on conceptual designs and anticipated future environmental, market and development conditions, and therefore should be considered representative prototypes that can be envisioned on the property. The materials contained herein note several other areas in which additional study should be pursued before drawing conclusions regarding the feasibility of any development of DLNR’s lands.

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Appendix A: Industrial and Commercial Market Demand Assessment Study, Colliers International Consulting, February 2020

Appendix B: East Kapolei Affordable Rental Market Study, Ricky Cassiday, February 2020

Appendix C: Hotel Market Assessment and Development Outlook, Erik Kloninger Consulting, February 2019

Appendix D: Infrastructure Study, R. M. Towill Corporation, February 2020

Appendix E: Economic Impact Analysis, Colliers International Hawaii, February 2020

Appendix A

Industrial and Commercial Market Demand Assessment

Department of Land and Natural Resources – Kapolei Lands Industrial and Commercial Market Demand Assessment Study

Prepared for RM Towill Corporation

Prepared by Colliers International Consulting
February 14, 2020

Colliers INTERNATIONAL

LIMITING CONDITIONS

The research undertaken in our report which underpins the estimates of future performance of the project are prepared in accordance with industry practice. Colliers Hawaii Research & Consulting ("Colliers") undertakes steps to determine whether the Client's assumptions underlying the estimates included in our report are fair and reasonable in the light of information provided and available. In our experience, these assumptions will have to be reviewed and revised by the Client periodically to reflect changes in the underlying market trends, trading patterns and the competitive environment.

Accordingly, we can offer no guarantees or warranties (expressed or implied) that the assumptions and resulting estimates set out in our report will be achieved. Our report identifies these hypothetical events or assumptions and any limitations to the usefulness of the presentation. Even if the hypothetical assumptions were to occur, there will usually be differences between the projected and actual results because events and circumstances frequently do not occur as expected, and the differences may by material.

The Client is responsible for representations about its plans, expectations, final assumptions to be used in the model and for disclosure of significant information that might affect the ultimate realization of the projected results. Our findings constitute only one of several factors for the Client to consider in its decision making process. The ultimate decision to move forward with the project rests with the project's management team.

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Executive Summary

Executive Summary

The State of Hawaii Department of Land and Natural Resources engaged RM Towill Corporation to prepare a strategic master plan for their vacant land parcels located in Kapolei. RM Towill Corporation selected Colliers International Consulting to prepare an analysis that assessed the potential market demand for various development options including industrial, retail and office uses.

Colliers believes that there is market demand to support an estimated 30-acre industrial park to be delivered to market between 2029 and 2034. This development would be situated on the parcels makai of the University of Hawaii West Oahu campus. Collier's industrial land absorption study included historical land sales, economic cyclicality , and development probabilities in its creation of its land demand models. Colliers projects that by 2034, total industrial demand for land will have risen to 176.3 acres of which a small percentage would be captured (conservative 10% to aggressive 20%) by the subject site's leasehold industrial park. Additionally, Colliers believes that the best time to introduce an industrial park to the marketplace would be between 2029 and 2034 when economic and market conditions are projected to be advantageous for industrial land sales.

In addition to an industrial park, Colliers evaluated the level of consumer support for retail development at the site. It was determined that there is very limited consumer support for additional retail development in this market until after 2029. Colliers believes retail demand would grow to support a retail center sized between 69,738 and 109,334 square feet in size by 2034. This retail center would focus on providing goods and services to both transit passengers, hotel patrons and residents residing within 1-mile of the Kapolei transit station.

Industrial Acreage Demand Findings

Concluded Demand Model	DLNR	2019	2024	2029	2034	2039
Residual Acreage Demand	Penetration Rate	-13.1	30.8	109.6	176.3	63.2
Conservative	10.00%	-1.3	3.1	11.0	17.6	6.3
Moderate	15.00%	-2.0	4.6	16.4	26.4	9.5
Aggressive	20.00%	-2.6	6.2	21.9	35.3	12.6

Retail Square Footage Demand Findings

WEIGHTED AVERAGE DEMAND ESTIMATE(50% Population/50% Consumer Expenditures)					
Scenario	2019	2024	2029	2034	2039
Conservative	(119,002)	(51,895)	(6,389)	69,738	119,780
Moderate	(116,398)	(42,069)	4,497	91,167	145,849
Aggressive	(114,169)	(33,718)	11,207	109,334	167,867
Recommendations: Start retail development after 2029 with a projected 35,000 to 50,000 sf					

Executive Summary

In addition to an industrial park and a retail center, Colliers evaluated the potential for an office development at this site . Based on projected office job growth, Colliers believes that there is market support for an estimated 15,768 to 23,653 square foot office development slated for delivery by 2039. Colliers recommends that should an office development be considered, a second floor should be added to a first floor retail development.

As part of this study, Colliers compiled a list of medical service tenants located within a 2 mile radius of the Kapolei transit station development site. Based on the number of medical services tenants and their respective number of employees, Colliers believes that 20% to 25% of the 15,768 to 23,653 square feet be allocated to medical office usage in this development.

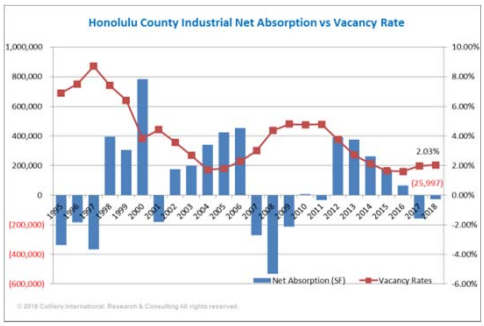
Office Square Footage Demand Findings

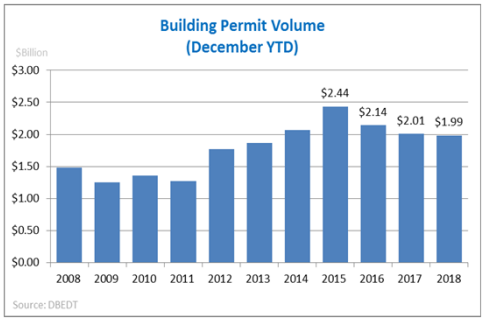
OFFICE DEMAND MODEL (Sq. Ft.)	2024	2029	2034	2039
CONSERVATIVE	4,170	7,846	11,708	15,768
MODERATE	5,869	9,415	14,050	18,922
AGGRESSIVE	7,336	11,768	17,563	23,653

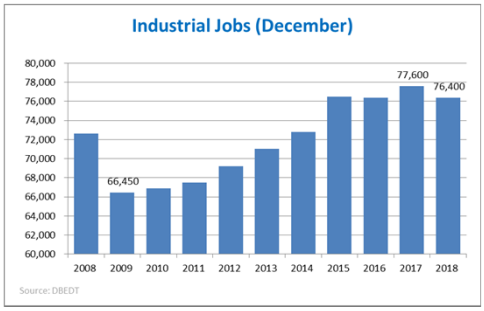
Medical Office Square Footage Demand Findings

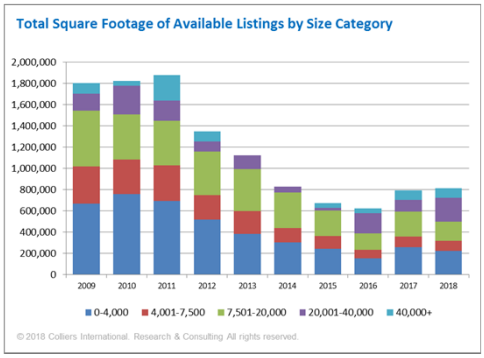
Medical Office Demand	2024	2029	2034	2039
Conservative	794.9	1,271.8	1,705.6	2,297.0
Moderate	1,324.8	2,119.7	2,842.6	3,828.3
Aggressive	1,854.8	2,967.6	3,979.6	5,359.6

Oahu Industrial Market Overview









Oahu Industrial Market

At the end of 2018, the Oahu industrial market posted its second consecutive year of occupancy losses. Despite the disconcerting 225,000 square feet of occupancy lost during this 2-year period, the dynamics of Oahu's tight industrial market remain virtually unchanged.

At year-end 2018, the industrial vacancy rate posted a 2.03%. Oahu remained one of the tightest industrial markets in the country, even as vacancy rates rose above 2.0% for the first time in four years. Prospective tenants continued to face a challenging leasing environment, including a lack of prime available space, rising land prices, and a lack of warehouse development.

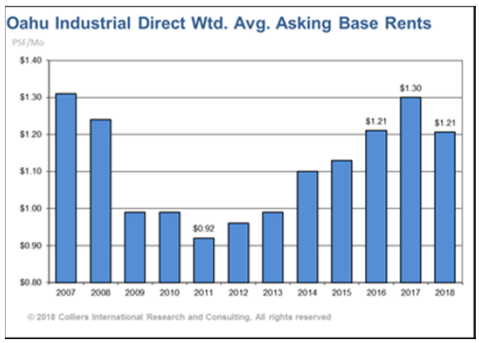
Warehouse demand is reliant upon a vibrant construction sector. While building permit volume remains elevated, it posted its third consecutive year of decline indicating slowing in construction activity. Similarly, the number of industrial jobs had declined by 1.5% since 2017, and this was due to a loss of construction sector jobs.

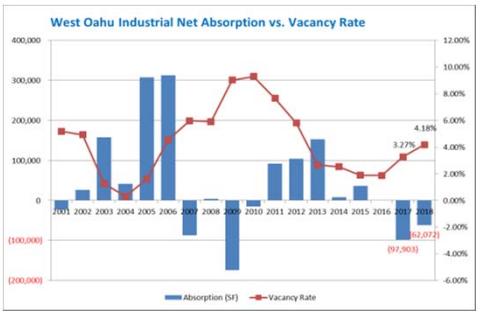
Colliers categorized all the available space listings into size ranges and compared the number of year-end 2018 listings to year-end 2017 levels. During the past year, the number of small listings (under 4,000 square feet) declined from 124 to 99, for a sizeable 20% drop.

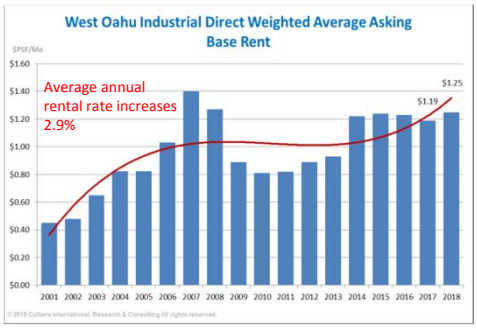
Although some industrial tenants have found homes, the meager supply of available space left poses a challenge for businesses still on the prowl. Only tenants seeking 20,000 square foot spaces or larger enjoyed an increase in options as the number of listings for this category doubled from 4 to 8 during the past year.

The University of Hawaii Economic Research Organization's fourth quarter economic forecast indicated that the State's gross domestic product would likely improve by a nominal 1.3% for 2019. The industrial market has long been identified as a coincidental indicator of the economy (which means that the industrial market performs with the rise and fall of the economy), and will likely match these economic gains with a similar pattern of marginal positive absorption and stagnant vacancy rates.

West Oahu Industrial Market Overview







The island-wide industrial direct weighted average asking base rent, which had been increasing at a healthy 6.9% annual pace between 2011 and 2017, declined for 2018. Colliers identifies this phenomenon as the "bottom of the barrel syndrome" whereby the only available warehouse space on the market are those of poor quality and functionally obsolete resulting in below market base rents.

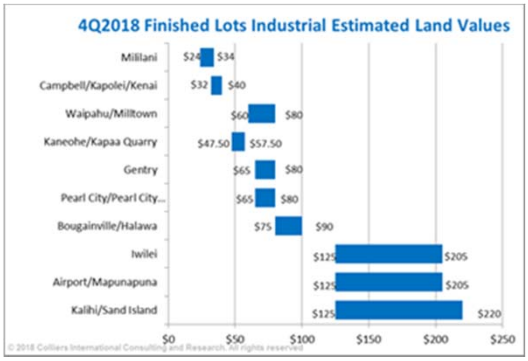
West Oahu Industrial Market

The West Oahu industrial marketplace is comprised of roughly 6.86 million square feet of inventory situated within Campbell Industrial Park, Kapolei Business Park, Malakole Industrial Park, Kenai Industrial Park and Kalaeloa Industrial Park (see industrial park graphic below) At the end of 2018, these industrial parks posted a loss of 62,072 square feet of tenant occupancy resulting in vacancy rates increasing to 4.18%.

The year-end 2018 average asking base rent for West Oahu industrial parks rose by 5% during the past year to $1.25 per square foot per month ("psf/mo"). During the past seventeen years, the average annual rate of growth for warehouse rents has been 2.9%.

Colliers projects that rents will continue to escalate, as warehouse development which has been limited to a few speculative developments, will not materially change the severe shortage that currently exists.

West Oahu Land Market



Industrial Land Prices and Speculative Development

The shortage of industrial warehouse space is directly related to the availability and pricing of industrial zoned land on Oahu. Urban Honolulu industrial zoned land surpassed $125 per square foot and is projected to continue to escalate. Several recent industrial zoned land transactions exceeded $200 per square foot.

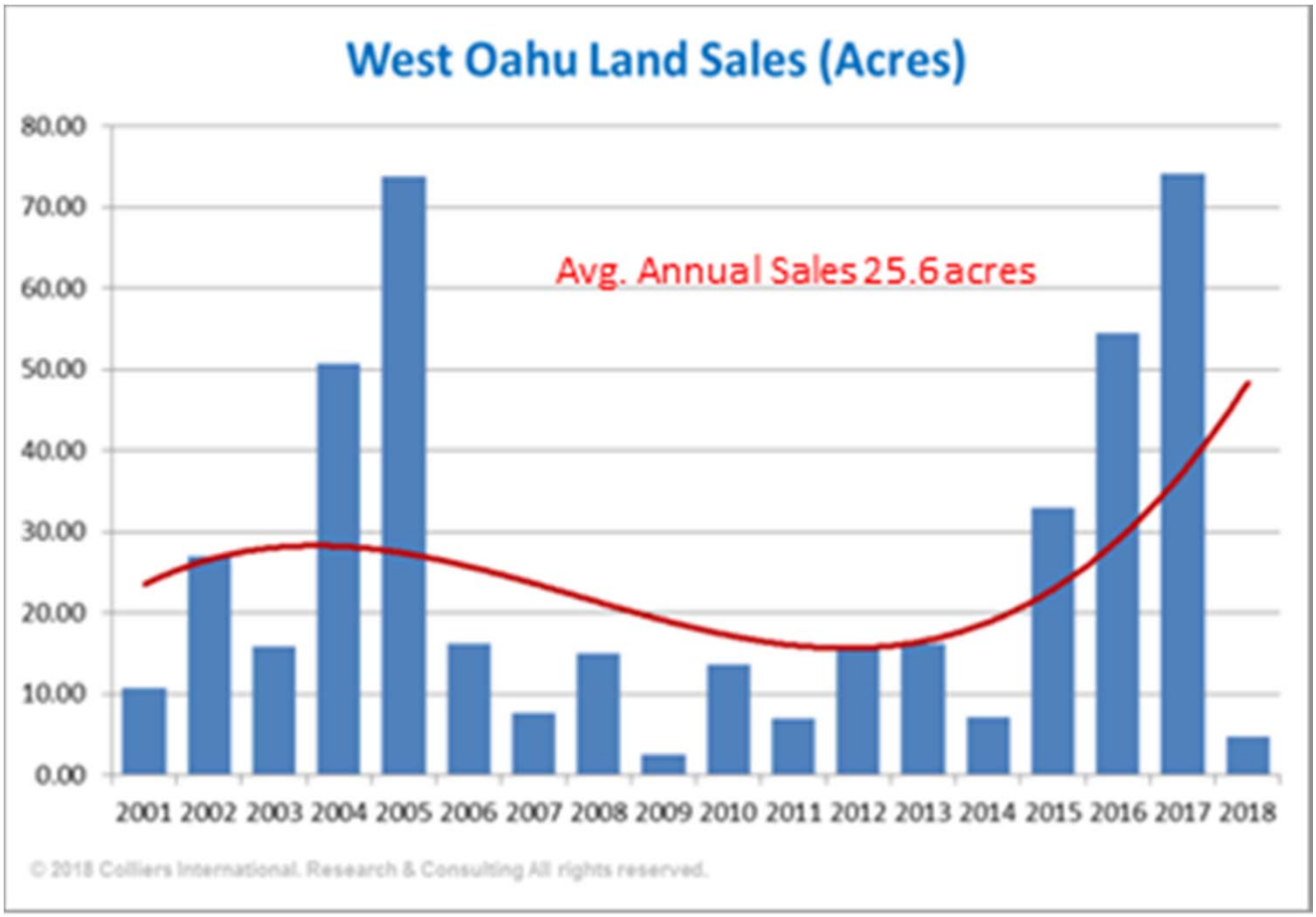
At these pricing levels, its virtually impossible for a developer to make a speculative warehouse development in urban Honolulu pencil. Colliers believes that rental rates would have to more than double to make a warehouse project financially feasible.

As a result of expensive land prices in urban Honolulu, industrial businesses seeking to expand will have to look to Mililani and West Oahu for lower priced land as potentially viable options. In 2018, Avalon Development built a 93,057 square foot warehouse development., named the Kapolei Enterprise Center. Before the project was fully constructed, this warehouse project was fully leased by the end of 2018.

The owner of Inspiration Furniture, Thomas Sorensen, has plans on building a 226,513 square foot speculative warehouse development at 91-150 Hanua Street. This would be the largest speculative warehouse development to be built in Hawaii. Pre-leasing activity began in January 2019.

Since both Avalon and Sorensen have a low cost basis in the land for their developments, this competitive price advantage allows development to become feasible at rental rates of $1.40 psf/mo. Kapolei Business Phase Phase II, which is nearly sold out of parcels, has prompted Avalon Development to begin marketing its next phase . Kapolei Business Park West, a 100-acre, 27-lot industrial park undergoing its pre-sales activities with prices ranging from $40 to $48 per square foot.

West Oahu Land Market



Cyclical Pattern of Land Sales

During the past seven years, developers capitalizing on rising land values marketed more than 100 acres of industrial zoned land for sale. Kapolei Business Park Phase I and Phase II as well as Malakole Industrial Park added to the inventory. Both Kapolei Business Park Phase I and Malakole Industrial Park are sold out, and the 24-lot Kapolei Business Park Phase II, which came to market last year, only has five parcels left for sale. With pricing ranging from $37.00 to $38.50 per square foot, listing brokers anticipate selling the last of these parcels by mid-year 2019.

Colliers tracked industrial land sales for West Oahu from 2001 to 2018. As the graph indicated, land sales have been very cyclical in nature. Typically, during periods of healthy economic growth, industrial zoned land sales escalate. During poor economic periods (i.e. Great Recession) land sales declined dramatically. During the past 19 years, land sales averaged 25.6 acres per year.

Proposed Industrial Park Developments

Name of Park	Total Acreage	Total Potential GLA (0.40 FAR)	Probability Percentage	Delivery Date for Parcel Sales
Kapolei Business Park West (Avalon/Walton Street Capital)	65	1,132,560	100%	2019
Honouliuli (Gentry Homes)	32	557,568	75%	2020
Ho'opili IMX Land (DR Horton)	45	784,080	75%	2021
Koa Ridge Industrial (Castle & Cooke)	10	174,240	50%	2023
Hunt Industrial Lands (Barbers Point)	25	435,600	50%	2023
Royal Kunia (HRT)	123	2,143,152	25%	2025
Kapolei Harborside (KPD)	250	4,356,000	50%	2025
Former Kiewit Site (Avalon Development)	35	609,840	50%	2027
Department of Land and Natural Resources Olai Lot	100	1,742,400	25%	2035
Total:	685	11,935,440		

Proposed Industrial Parks

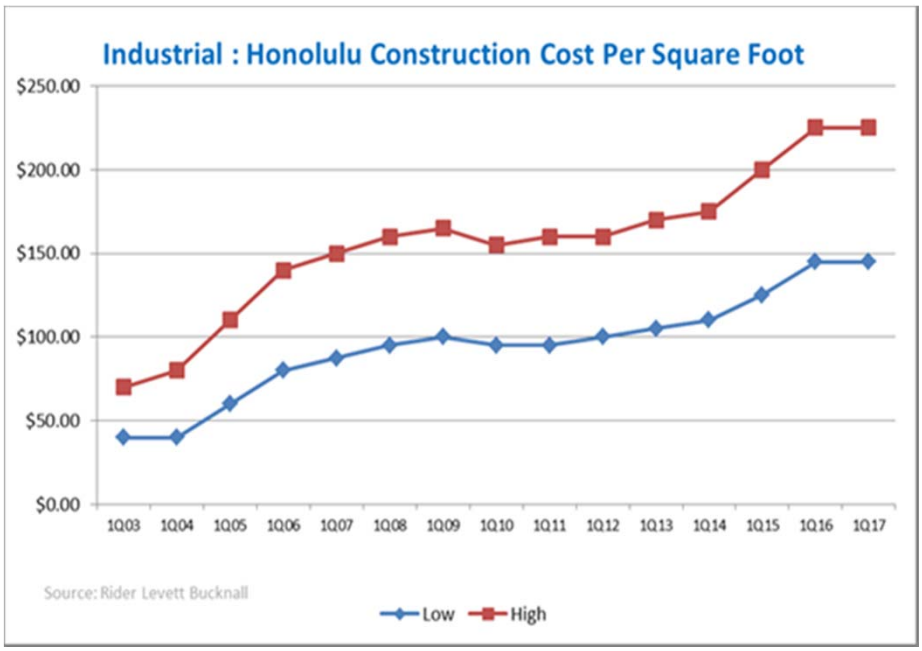
The above list is a compilation of planned or proposed industrial parks for Oahu. Colliers tracked roughly 685 acres of potential industrial land becoming available for sale/lease for the next 16 years (2019 to 2035). These parks would be considered direct competition for an industrial development located on DLNR's Kapolei land sites.

Using an FAR of 0.40 , these 685 acres could potentially be converted into more than 11.9 million square feet of industrial warehouses, but the likelihood of this level of industrial development inhibited by rising construction costs and land prices. Industrial broker feedback was used to help identify the probability of these industrial parks being built, as well as their potential delivery of parcels for sale.

Proposed Industrial Park Developments

Historical Construction Costs Analysis

Rider Levett Bucknall, a construction cost estimation firm, compiled historical data that compared warehouse development costs for Honolulu. Over the past thirteen years (1Q2013 to 1Q2017) warehouse construction costs have risen by a robust 236%. The average annual increase in warehouse development costs during this time was a very healthy 18%. During this time period, a number of industrial condominiums were built during the Great Recession (2008-2009), unfortunately many of these projects ended in foreclosure.



Development is an inherently risky endeavor, the existence of just one of the following: poor economic conditions, volatile financial markets, and rapidly rising construction and land costs could easily jeopardize the feasibility of a new project. Without rental rates keeping up with rising land and construction costs, a potential project could not achieve the required returns desired by the developer.

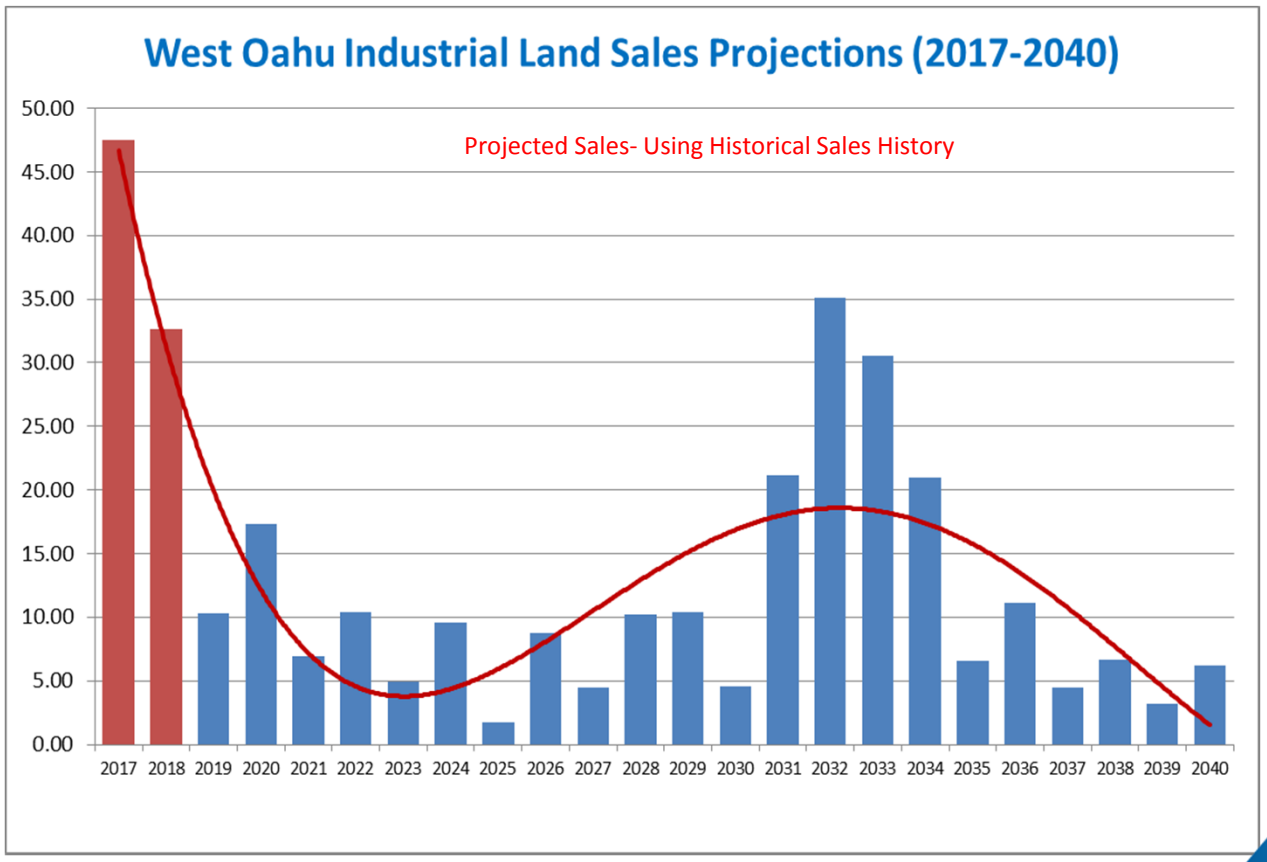
A very basic calculation of development feasibility, at $34 per square foot of land and an FAR of 0.40, this equates to a land price of $85.00 per square foot. Using construction costs of $135 per square foot, the developer's costs to build a warehouse would be roughly $220 per square foot. For a 40,000 square foot warehouse, the total costs would be $8,800,000. Should industrial space lease rents rise to $1.40 per square foot per month in rent, the annual return on this ground up development would be 7.64%, well-below most developer's required return rates.

Demand Model Methodology

Demand Model Methodology

The wide variation in annual land sales during the past 18 years (as indicated by the below graph) indicated that at the height of economic growth, industrial land sales could exceed 45 acres per year, in contrast, a poor economy could result in fewer than 5 acres of land sold.

In the creation of a land absorption/demand model, Colliers incorporated the cyclical land sales pattern into its forecast for land sales. Using historical trends, Colliers anticipates the next peak in land sales to occur sometime between 2031 and 2034.



Demand Model Methodology

Supply vs. Demand - Industrial Land Absorption Summary							
			2019	2024	2029	2034	2039
	Projected Acreage Delivered		65				
Average Annual Land Sales Model	Harborside Planned Delivery					26.4	
	Total Acres Available For Sale		65.00	0.00	0.00	26.40	0.00
	Annual Average Acres Absorbed		25.59	25.59	25.59	25.59	25.59
	Residual Acreage (cumulative)		39.41	69.96	-22.99	-43.24	35.41
			2019	2024	2029	2034	2039
	Projected Acreage Delivered		65.0				
Cyclical Land Sales Model	Harborside Planned Delivery					26.4	
	Total Acres Available for Sale		65.0	0.0	0.0	26.4	0.0
	Cyclical Land Sales		65.0	4.8	10.3	8.8	2.7
	Residual Acreage (cumulative)		0.0	-4.8	-10.3	17.6	-2.7
			2019	2024	2029	2034	2039
	Industrial Land for Sale		65			13	
Cyclical Land and Development Probability Model	Cyclical Land Sales		65.0	4.8	10.3	8.8	2.7
	Residual Acreage (cumulative)		0.0	-123.4	-203.9	-320.8	-254.6
			2019	2024	2029	2034	2039
	Industrial Land for Sale		65.0	0.0	0.0	22.0	0.0
Concluded Demand Model	Cyclical Land Sales		51.9	11.7	15.4	14.4	10.3
	Residual Acreage (cumulative)		13.1	-30.8	-109.6	-176.3	-63.2

Colliers created four industrial land absorption demand models that are based on the rate of land sales and the probability that an industrial park development gets delivered to the Oahu market. The first of these models " **Average Annual Land Sales Model**", utilized the average annual sales of 25.59 acres of land per year to estimate the demand for industrial land. This model also assumed that each of the proposed industrial parks would get built by the date of their expected delivery.

The "**Cyclical Land Sales Model**" takes into account the likelihood that land sold each would follow a cyclical pattern similar to those from the prior two economic cycles.

The "**Cyclical Land and Development Probability Model**" incorporates the cyclical land sales pattern and also includes a development park probability factor. This model would be the most conservative of the three models described.

The "**Concluded Demand Model**" applies a weighting factor to the prior three demand models to determine the amount of land sold per year. This is the demand model that Colliers based its land absorption calculations upon.

DLNR Industrial Land Absorption Projections

Projected DLNR Industrial Land Sales (Acres)

Concluded Demand Model	DLNR	2019	2024	2029	2034	2039
Residual Acreage Demand	Penetration Rate	-13.1	30.8	109.6	176.3	63.2
Conservative	10.00%	-1.3	3.1	11.0	17.6	6.3
Moderate	15.00%	-2.0	4.6	16.4	26.4	9.5
Aggressive	20.00%	-2.6	6.2	21.9	35.3	12.6

Based on the concluded demand estimate, the land absorption estimate for the DLNR site includes a market penetration rate. The market penetration rate is the percentage market share that the DLNR site is able to capture from the total residual acreage demand. A conservative estimate would be a 10% market penetration rate, an aggressive capture rate would be 20%.

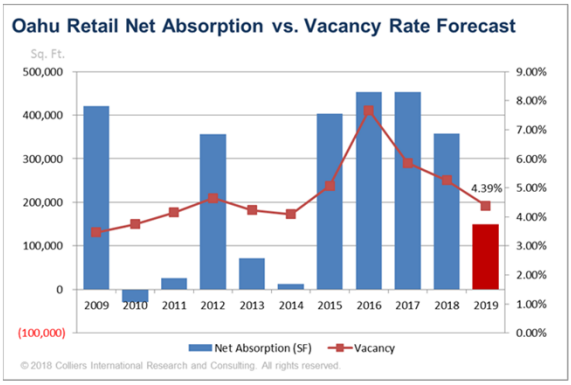
In addition to the availability of competing fee simple industrial zoned land, DLNR should also realize that leasehold tenure is viewed as a negative factor for many developers and investors. A combination of favorable upfront ground rent terms and development conditions should be considered to increase the attractiveness of development for this land.

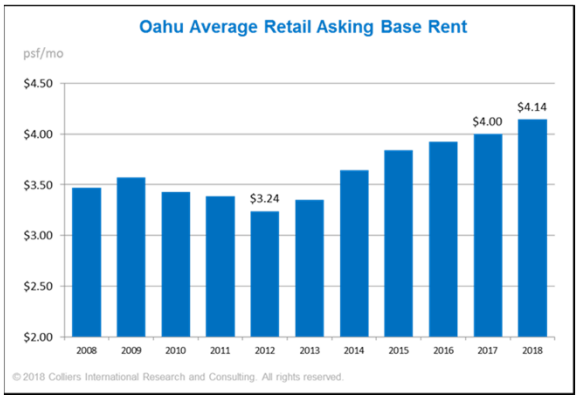
The most favorable window of opportunity for DLNR to develop an industrial park is occur between 2024 and 2034. Colliers projected that there is demand for leasehold land ranging from 17.6 to 35.3 acres that could be absorbed by 2034 for a DLNR industrial park.

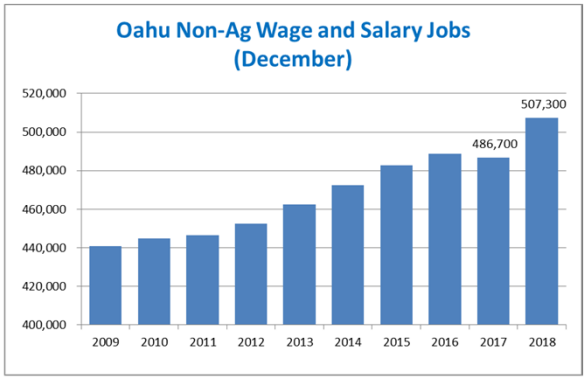
1. **Industrial absorption land model projects that an industrial park of roughly 11 to 35 acres will be supported by industrial demand between 2029 and 2034.**

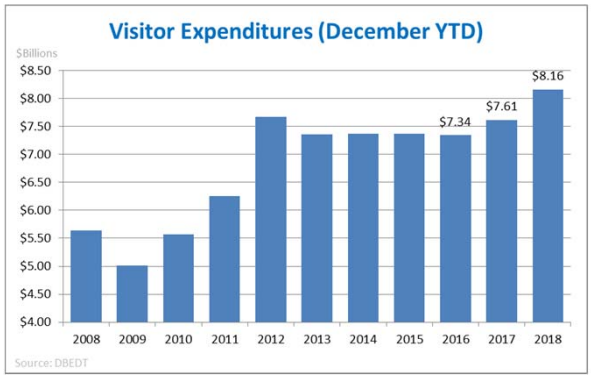
2. **Colliers recommends a 30 acre industrial park be developed at the site north of Farrington Highway adjacent to the UH West Oahu campus.**

Oahu Retail Market Overview









Oahu Retail Market

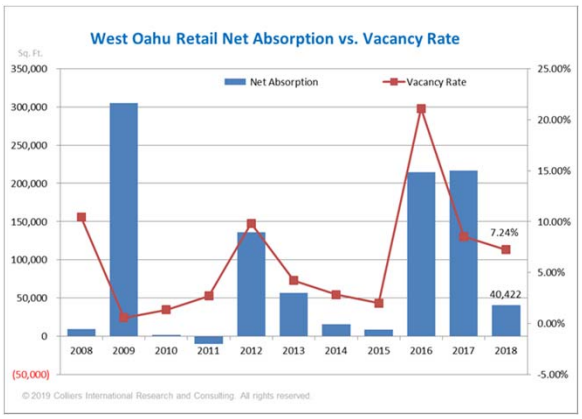
The Oahu retail market posted a solid 358,000 square feet of net absorption for 2018, as vacancy rates declined to 5.26% from 5.85% recorded at year-end 2017. With more than 2.1 million square feet of new tenancy boosting the market, occupancy growth continued for the eighth consecutive year. For 2018, the retail market benefitted from newly expanded regional retail centers, the construction delivery of several new strip centers, and the leasing of several large vacant big box stores.

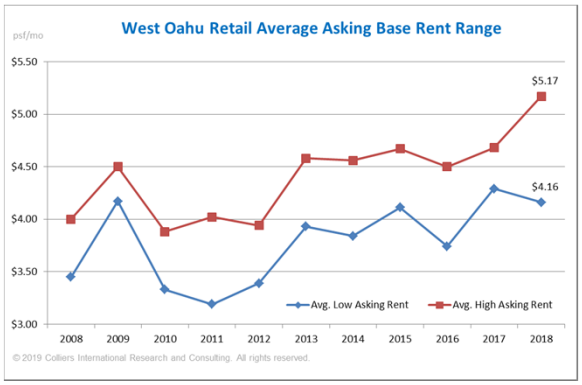
Expanding regional malls, Ala Moana Center, International Market Place, and Ka Makana Alii, have added more than 1.4 million square feet of new retail inventory over the past three years. With this progress, a number of new tenants have been introduced to our retail market, including notable brands such as Home Goods, Ulta Beauty, Bloomingdales, Saks Fifth Avenue, Lucky Strike, Applebees, Five Guys Burgers, Eating House 1849, Mitsuwa Marketplace, and Strip Steak. During the past year, these regional centers contributed more than 180,000 square feet of positive tenancy growth in 2018.

Oahu's economy continues to be a bright spot, as job growth posted a gain of 20,600 new positions over the past year. These newly minted jobs helped to keep the island's unemployment rate of 2.3% for December 2018, among the lowest in the country. The retail industry generated a solid 2,600 new positions during the past year as retailers continued to expand and grow in our marketplace.

In addition to job growth, tourism hit another record high, with year-to-date December tourist arrivals rising to 5.94 million, a healthy gain of 4.6% over last year's levels. Additionally, year-to-date December visitor expenditures rose to another record high of $8.162 billion, a robust gain of more than 7.2% over 2017 levels.

West Oahu Retail Market Overview





West Oahu Retail Market

The West Oahu retail market is comprised of 1.74 million square feet of retail shopping centers and is situated among the island's fastest growing residential populations. At the end of 2018, the West Oahu retail market generated its seventh consecutive year of positive net absorption of 40,422 square feet resulting vacancy rates falling to 7.24%.

During the past seven years, nearly 690,000 square feet of retail occupancy growth occurred. Much of this new retail tenancy can be attributed to new retail center developments that were delivered to the market. The opening of Kapolei Commons, Kapolei Village shops, Laulani Village, Ka Makana Alii and Kealanani Plaza all occurred during this time period.

West Oahu retail rental rates continued its upward path during gaining a healthy 27% jump since the end of 2012. This increase in retail rents contributes to the heightened interest by developers to build additional retail in the area.

Proposed Oahu Retail Developments

Name of Project*	Location	Retail GLA	Projected Delivery Date	Developer
Kapolei Neighborhood Center	Kapolei	16,100	2019	Fred Lau - Commercial Development in Hoopili near Konane Park.
Ka Makana Alii Regional Mall	Kapolei	109,000	2019	DeBartolo Development - Number of spaces are under construction and not delivered yet
Nanakuli Village Center	Waianae	34,733	2019	Department of Hawaiian Home Lands, Nanakuli Hawaiian Homestead Community Assocation
1020 Wakea St	Kapolei	10,000	2019	Coastal Rim Properties, Inc.
4680 Kapolei Parkway	Kapolei	3,000	2019	7 Eleven, Par Hele/76 Gas Station, Starbucks
North Shore Gateway Project	Haleiwa	2,000	2019	Lucky Cole
Hoomaka	Kapolei	50,000	2019-2020	DHHL - KZ Companies(Longs Drug) - Corner of Kualakai and Kapolei Parkways
Kahala Redevelopment	Honolulu	40,000	2020	Kuono Village-Kahala Redevelopment
Mehana Commercial Condos	Kapolei	6,000	2020-2022	DR Horton
Kapolei Commons	Kapolei	100,000	2020-2025	McNaughton Group - Two 50,000 sf expansion sites
Lilia Waikiki	Honolulu	36,000	2020-2022	Oliver McMillan Residential Rental Housing Project
Koa Ridge Commercial Phase I	Waipahu	550,000	2019-2021	Castle & Cooke -PRELEASING ACTIVITY
Wai Kai at Hoakalei	Ewa Beach	215,000	2019-2021	Wai Kai commercial LLC - Lawrence Caster-PRELEASING ACTIVITY
Hilton Grand Vacations (King's Village site)	Honolulu	TBD	2020-2022	Hilton Grand Vacations
Mayor Wright Homes Redevelopment	Honolulu	80,000	2020-2025	Hunt Development
Sky Ala Moana	Honolulu	16,400	2022	Avalon Development
Moiliili Gateway	Honolulu	213,500	2021-2022	Kamehameha Schools
Ward Village - Koula/Aalii	Honolulu	30,000	2021-2023	Howard Hughes Development
Princess Kaiulani Redevelopment	Honolulu	40,000	2022-2025	Kyoya
Neal Blaisdell Center Redevelopment	Honolulu	25,000	2022-2025	TBD
Aloha Stadium Redevelopment	Aiea			TBD
	Totals:	1,576,733		

Proposed Retail Developments

Colliers compiled a table of all the proposed retail projects on Oahu and estimated that there is still nearly 1.6 million square feet that could be built by 2025. For the West Oahu marketplace, there is an estimated 509,100 square feet of projects (from Kapolei to Ewa Beach) that could be added to the retail inventory. The largest of these projects include expansion plans for Ka Makana Alii and Kapolei Commons, and the development of Wai Kai in Hoakalei and the Longs Drug anchored Hoomaka retail center in Kapolei.

Concerns have been raised that with all this planned retail development that a retail saturation point could be reached and an oversupply of retail square footage would occur. The hope is that new residential master planned communities (such as those located in Ho'opili and DHHL) continue to add additional households to boost consumer demand for retail goods and services in the area.

Retail Population Demand Model

Population Demand Model

Colliers developed a Population Model to identify the level of consumer demand for a retail development. This model examines the demand potential from the existing population and projected population growth using an average retail square footage per resident ratio.

The residual demand is calculated by subtracting the current and planned inventory of retail shopping center space in the primary and target market from the calculated total retail demand. If the residual demand is positive, it would indicate that there is a need for additional retail space to be built.

By using U.S. Census figures and demographic market reports, Colliers can evaluate whether population projections provide an accurate indication of a geographic region's growth. Typically, in a market with healthy residential development, retail demand is generated. Colliers uses information on population and household formation growth, as well as planned residential development for the target area to calculate retail demand.

The International Council of Shopping Centers ("ICSC") calculates national ratios for the amount of retail square footage per resident. Nationally, ICSC recorded 17.89 billion square feet of estimated retail gross leasable area ('GLA") which equates to 55.4 square feet per resident. Colliers takes into account the rapid growth of e-commerce (15% of total sales) into these figures and reduced the national GLA per resident to 47.1 square feet. Colliers also tracks these ratios on a statewide, county wide and geographic specific basis with the use of its proprietary commercial property database. For this analysis, we used a conservative ratio range of 42 to 48 square feet per resident for the primary trade area. **Conservative GLA/Resident is 42 square feet, moderate GLA/Resident of 45 square feet and aggressive of 48 square feet.**

Lastly, Colliers uses a "market penetration rate" to determine the percentage of the market that would likely shop at the subject property. For a market with few retail developments, a new development would generally have a higher capture rate than that for a market with a large number of competitive retail centers.

Retail Population Demand Model

The population demand model also takes into account the area's transient population (tourists and transit line users). The transient retail demand component identifies hotels within the target market, their occupancy rates , the average number of hotel room occupants and their average daily retail expenditures to come up with an estimated retail square footage demand.

Additionally, DLNR's target development site near the planned Kapolei rail station has plans for a 1,000 stall transit parking lot. This parking lot enhances the customer base for a potential retail development. Colliers estimated a range of 40%, 50% and 60% parking stall occupancy to extrapolate the potential number of consumers that spend were estimated to spend $10 per day for retail goods and services at this site. We added the transient demand to the population demand to derive total retail demand for the development site.

Based on our population demand model, by 2029 there would be support for a retail development sized between 44,924 square feet to 72,504 square feet . By 2034, retail demand would grow to a conservative development of 95,233 square feet to an aggressive development of 130,827 square feet in size.

TOTAL RETAIL DEMAND ESTIMATE - POPULATION MODEL

PRIMARY MARKET RESIDUAL DEMAND (sf)

Scenario	2019	2024	2029	2034	2039
Conservative	(82,941)	(17,247)	39,684	89,448	133,083
Moderate	(81,068)	(10,346)	50,381	103,462	150,007
Aggressive	(78,570)	(1,143)	64,644	122,149	172,572

TRANSIENT MARKET RETAIL DEMAND

Scenario	2019	2024	2029	2034	2039
Conservative	4,299	4,746	5,240	5,785	6,388
Moderate	5,373	5,933	6,550	7,232	7,985
Aggressive	6,448	7,119	7,860	8,678	9,581

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf)

Scenario	2019	2024	2029	2034	2039
Conservative	(82,941)	(17,247)	44,924	95,233	139,471
Moderate	(81,068)	(10,346)	56,931	110,694	157,992
Aggressive	(78,570)	(1,143)	72,504	130,827	182,154

Retail Consumer Expenditures Demand Model

Consumer Expenditures Demand Model

The Colliers population model has some inherent weaknesses, especially for markets that lack residential development opportunities or have limited population growth. Under this scenario, the population model would under-estimate the level of consumer demand for retail goods and services for geographies with with high household incomes.

To supplement the Population Demand model, Colliers created a Consumer Expenditures model to estimate the level of consumer support for a retail development. The Consumer Expenditures model evaluates a market's retail potential based on actual retail sales being generated by the target audience. ICSC identified total U.S. retail shopping center GLA of 7.6 billion square feet which generated $2.64 trillion in annual retail sales. This is equivalent to an average of $346 per square foot of retail shopping center GLA.

Colliers uses retail expenditure data and projections from the U.S Census (Environomics Analytics™ and Regis/Sites USA ™) demographic market reports. Additionally, retail sales per square foot ratios from ICSC were modified to best fit Hawaii's retail market and the average sales per square foot ratio for Hawaii shopping centers were incorporated into our analyses. Taking into account the average sales per square foot for Honolulu County and five comparable Oahu shopping centers, Colliers identified the average sales per square foot for Oahu to be $461.14. **For purposes of this report, our aggressive development scenario used a retail sales per square foot ratio of $425, our moderate retail sales ratio was $475, and our conservative scenario used a $525 ratio.**

The residual demand for the Consumer Expenditures demand model is calculated by subtracting the current inventory of retail shopping center space in the primary target market from the estimated total retail demand**.** If the residual demand is positive, it would indicate that there is a need for additional retail space to be built. Based on the range of potential demand elements, Colliers calculates for a conservative, moderate and aggressive development scenario.

AVERAGE RETAIL SALES PER SQUARE FOOT	
U.S. Retail Mall Sales/SF [1]	$346.00
Honolulu County Sales/SF [2]	$352.00
Kanoehe Bay Shopping Center[2]	$770.00
Kunia Shopping Center[2]	$481.00
Waipio Shopping Center [2]	$708.00
Pearl Highlands Center [2]	$273.00
Town Center of Mililani [3]	$298.00
Average	$461.14

1 - International Council of Shopping Center Estimate

2 - Department of Taxation, Colliers International

3 - Interviews with or information from selected asset managers

The following is our estimate of the residual retail demand based on anticipated consumer expenditure growth for the Waiawa primary and secondary trade areas.

Retail Consumer Expenditures Demand Model

Similar to the population demand model, the consumer expenditures model uses the estimated residential unit absorption as the primary growth catalyst for the consumer expenditures model. Colliers uses consumer expenditures data from Environomics Analytics to determine the average household retail sales. Any additional households added to the market will increase the level of potential retail sales and ultimately retail demand.

Transient demand is also included in the calculation of retail demand for this model. Colliers included the development of a limited service hotel and the transit station 1000-stall parking lot to the site by 2025. Both hotel guests and transit ridership will add additional consumer support for a retail development.

Consumer Expenditure Model Retail Demand Estimates

TOTAL RETAIL DEMAND ESTIMATE - CONSUMER EXPENDITURES MODEL					
PRIMARY MARKET RESIDUAL DEMAND (sf)					
Scenario	2019	2024	2029	2034	2039
Conservative	(158,283)	(90,098)	(21,944)	39,908	95,303
Moderate	(155,755)	(78,238)	(2,463)	66,221	127,724
Aggressive	(154,599)	(71,627)	8,665	81,338	146,401

TRANSIENT MARKET RETAIL DEMAND					
Scenario	2019	2024	2029	2034	2039
Conservative	3,221	3,556	3,926	4,335	4,786
Moderate	4,026	4,445	4,908	5,419	5,983
Aggressive	4,832	5,334	5,890	6,503	7,179

CONSUMER EXPENDITURES MODEL - POTENTIAL RETAIL DEMAND (sf)					
Scenario	2019	2024	2029	2034	2039
Conservative	(155,062)	(86,542)	(18,018)	44,243	100,089
Moderate	(151,729)	(73,792)	2,445	71,640	133,707
Aggressive	(149,768)	(66,292)	14,554	87,840	153,580

*Light rail projected start date, parking lot being used

*Hotel opened upon light rail start date

Concluded Demand Model

Weighted Average Concluded Retail Demand

By combining the population and the consumer expenditure retail demand models, we hope to take into account those factors that influence retail demand. Colliers combined these models and provided a weighting system that placed a 50% weight on the population model and a 50% weight on the consumer expenditure model to derive the concluded demand model.

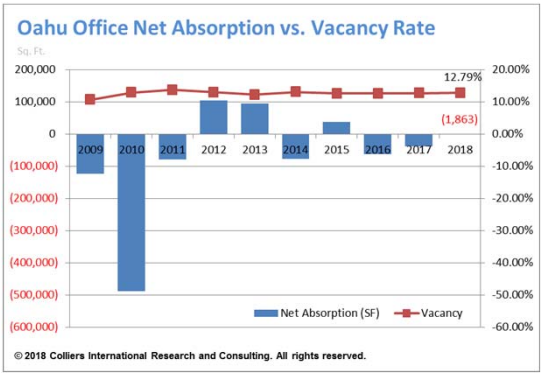
Concluded Retail Demand Model

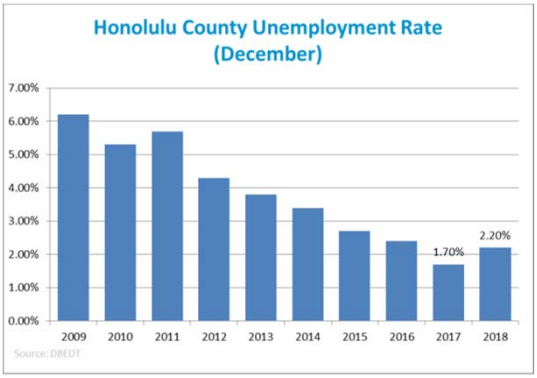
RETAIL DEMAND ESTIMATE					
POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf)					
Scenario	2019	2024	2029	2034	2039
Conservative	(82,941)	(17,247)	5,240	95,233	139,471
Moderate	(81,068)	(10,346)	6,550	110,694	157,992
Aggressive	(78,570)	(1,143)	7,860	130,827	182,154
CONSUMER EXPENDITURES MODEL - POTENTIAL RETAIL DEMAND (SF)					
Scenario	2019	2024	2029	2034	2039
Conservative	(155,062)	(86,542)	(18,018)	44,243	100,089
Moderate	(151,729)	(73,792)	2,445	71,640	133,707
Aggressive	(149,768)	(66,292)	14,554	87,840	153,580
WEIGHTED AVERAGE DEMAND ESTIMATE(50% Population/50% Consumer Expenditures)					
Scenario	2019	2024	2029	2034	2039
Conservative	(119,002)	(51,895)	(6,389)	69,738	119,780
Moderate	(116,398)	(42,069)	4,497	91,167	145,849
Aggressive	(114,169)	(33,718)	11,207	109,334	167,867
Recommendations: Start retail development after 2029 with a projected 35,000 to 50,000 sf					

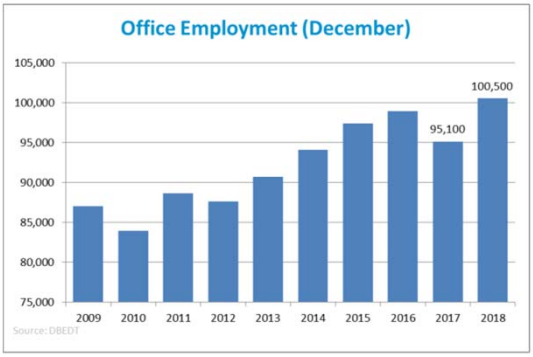
The Weighted Average Concluded Demand model indicated that the Kapolei retail market will likely remain saturated until 2029. Subsequently, retail demand grows to a range of 69,738 to 109,334 square feet by 2034.

The soonest a retail development can be built at the site would be 2030-2032 when a 35,000 to 50,000 square foot retail would be supportable. Additional phases to this retail development could grow to 119,780 to 167,867 square foot center by 2039.

Oahu Office Market Overview







Oahu Office Market

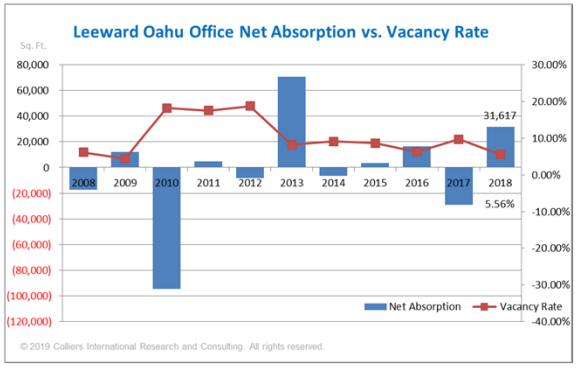
For more than seven years the Oahu office market posted vacancy rates ranging from 12% to 14% and at year-end 2018 this has not changed. The market reported a vacancy rate of 12.79% after a slight loss of 1,863 square feet of tenancy occurred during the year.

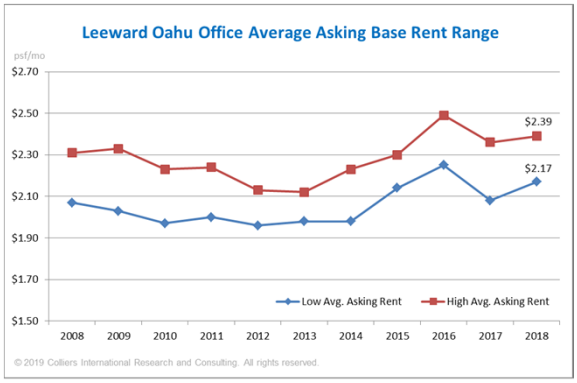
Typically, after an extended period of healthy office job growth, the office market responds with a decline in vacancy rates. Since the end of the Great Recession, Oahu's unemployment rate has declined to 2.2% at the end of 2018 and the office sector has generated a gain of more than 16,000 jobs since the end of 2010. In fact, during the past year, the office sector added 5,400 positions and generated the largest number of new jobs among the major industry sectors for the past year.

The island-wide average asking base office rent remained flat for the year, posting a rate of $1.76 per square foot per month ("psf/mo"). Leeward, East and Windward Oahu office submarkets have posted lower vacancy rates and stronger tenant demand than those located in the CBD. In fact, average asking base rents among the suburban office markets have been the primary driver of rental rate increases between 2013 and 2017.

A transition to the office market is forecasted over the next few years. One of the major Class A office building landlord, Douglas Emmet , has explored ways to change the current dynamic of this market . Their plans include converting one of their office buildings, 1132 Bishop Street , into a residential rental project. Upon completion, this building redevelopment will result in a decline to the Central Business District's vacancy rate 16.44% to below 10%.

Leeward Oahu Office Market Overview





Leeward Oahu Office Market

The Leeward Oahu office market is comprised of 719,228 square feet and encompasses a wide geographic area inclusive of Kapolei, Ewa Beach, Pearl City, Waipahu and Mililani. At year-end 2018, the Leeward Oahu submarket generated a positive gain of 31,617 square feet of office tenancy resulting in a drop to the area's vacancy rate to 5.84%.

Due to these healthy market conditions, the Leeward office market's asking rental rate range has exceeded those of urban Honolulu. At year-end 2018, most office rents in this market fell between $2.17 psf/mo and $2.39 psf/mo.

While tight market conditions are likely to push rental rates upward, its unlikely that a speculative office building will be built. The high costs of land and construction pricing combined with low office rents will likely inhibit developers from building additional office in Kapolei.


James Campbell Building in Kapolei

Kapolei Office Demand Model

Kapolei Office Demand Analysis and Projected Net Absorption

Colliers examined job growth and average annual net absorption to project office demand for the Kapolei area. Colliers' office demand model uses job growth rate projections from the Department of Business, Economic Development & Tourism ("DBEDT") and applies it to the employment base. Since DBEDT only projects through 2020, we used the 10-year average (2011 to 2020) of 0.72% for the rest of the analysis period.

The island-wide benchmark of 127 square feet per employee (total office market inventory divided by office employment from the information, financial activities, and professional & business services sectors) was used to estimate the growth of the office market demand per employee. Each year of projected office job growth would result in additional demand for office space.

The Kapolei office market has several office buildings that would be in competition for this additional office space demand. We assumed a range of capture rates for the DLNR office site of 10%, 12%, and 15%.

Office Sector Job Growth (# of new employees)	2024	2029	2034	2039
	228	426	631	843
	328	618	922	1,242
	396	749	1,123	1,521
SF Demand				
	28,957	54,078	80,091	107,027
	41,703	78,457	117,085	157,684
	50,306	95,116	142,680	193,167
Penetration Rate				
	2,896	5,408	8,009	10,703
10.00%	4,170	7,846	11,708	15,768
	5,031	9,512	14,268	19,317
	3,475	6,489	9,611	12,843
12.00%	5,004	9,415	14,050	18,922
	6,037	11,414	17,122	23,180
	4,344	8,112	12,014	16,054
15.00%	6,255	11,768	17,563	23,653
	7,546	14,267	21,402	28,975

Concluded Kapolei Office Demand

OFFICE DEMAND MODEL (Sq. Ft.)	2024	2029	2034	2039
CONSERVATIVE	4,170	7,846	11,708	15,768
MODERATE	5,869	9,415	14,050	18,922
AGGRESSIVE	7,336	11,768	17,563	23,653

Concluded Office Space Demand Recommendations

The office space demand for DLNR's Kapolei transit station site would range from a conservative 7,846 square feet to an aggressive demand of 11,768 square feet for an office development delivered in 2029. This office demand increases to a conservative 15,768 to 23,653 square feet by 2039.

Colliers recommends building 15,768 to 23,653 square feet of office space with a delivery date between 2034 and 2039.

Kapolei Medical Office Demand

Kapolei Medical Office Demand

Colliers secured a list of medical services businesses within a 2 mile radius of the DLNR Kapolei Transit station site. This list provided information relating to the number of employees, sales revenues and address and excluded hospitals. An assumption was made that medical office tenants use an average of 225 square feet per employee (inclusive of examination room, waiting rooms, doctor's offices and administration/records storage spaces.

An assumption was made that medical services would typically sign up for a five year lease term, which results in a 20% lease turnover rate. This would result in the total annual demand for medical office space per year. Colliers also assumed that a new medical office development located at the DLNR site would capture 5% of this total annual demand.

Colliers believes that by 2034, there would be medical office space demand that would range from a conservative 1,706 square feet to 3.980 square feet for an aggressive development. **Colliers believes that there will be enough medical office demand to support building 3,000 to 5,000 square feet of medical office space by 2039.**

Medical Office Demand	2024	2029	2034	2039
Conservative	794.9	1,271.8	1,705.6	2,297.0
Moderate	1,324.8	2,119.7	2,842.6	3,828.3
Aggressive	1,854.8	2,967.6	3,979.6	5,359.6

Appendix B

East Kapolei Affordable Rental Market Study

I. OVERVIEW

A team put together by R. M. Towill Corporation studied the viability of developing a large land parcel in East Kapolei owned by State of Hawaii, Department of Land and Natural Resources (DLNR). Ricky Cassiday was tasked to describe and analyze the demand for affordable housing rentals in that area.

II. SCOPE OF WORK

The following was developed as the Scope of Work:

Residential Market Rental Demand and Feasibility Analysis

- Kapolei Residential Rental Market Overview
- Kapolei Residential Rental Market Demand Study - Affordable, Senior, Student Sectors
- Kapolei Residential Rental Competitive Market Study (Identify Existing and Planned Projects)
- Kapolei Residential Rental Rate Study
- Consumer Market Demographic Profile Report
- Rental Housing Annual Absorption Projections (5, 10 and 20 year)

III. DESCRIPTION OF MARKET ANALYST

Since 1991, Ricky Cassiday has studied residential real estate markets throughout Hawaii. A list of clients and studies is attached hereto as Exhibit A.

Note that the data and statements herein are based on independent research and are in no way contingent upon outside findings or recommendations.

IV. DESCRIPTION OF PROPOSED SITE

The site is in East Kapolei, Honouliuli and is identified by Tax Map Keys (TMK): (1) 9-1-016: 008; (1) 9-1-017: 097; and (1) 9-1-018: 005 and 008. There are a number of possible uses for the land, including industrial and residential.

Per the landowner, the residential uses for this land will be restricted to rental housing. For the purposes of this study, we will assume that the maximum number of rental units will be studied. This would be around 1,000 units, if the plan limits the height of the residential buildings on the site to 4 stories (20 dwelling units (du) per acre). However, if the maximum height was to be higher, depending on which TOD guidelines were followed, this 1,000 could double to 2,000 units.

V. GEOGRAPHIC DEFINITION OF MARKET AREA

The City of Kapolei, plus the surrounding areas of West Oahu, Mililani and Pearl City/Aiea, will serve as the Primary Market Area (PMA) for this study. Such a definition was analyzed and deemed appropriate for the following reasons:

- It fits the within the flow of traffic going into the primary employment center of Honolulu, originating from areas such a Waianae, Ewa, Makakilo, and Royal Kunia;
- It sits within where the area's low- and middle-income families would contemplate relocation; and,
- It reflects the fact that there is an acute need for affordably priced shelter in the area.

Further analysis determined that the Secondary Market Area (SMA) would encompass the entire island of Oahu. Such a definition was analyzed and deemed appropriate for the following reasons:

- There are no natural boundaries in Honolulu to inhibit relocation;
- The entire island's population lives in close proximity to one another, within a 22-mile radius;
- A large percentage of the current housing stock on the island is old, worn, poorly designed and constructed; and
- There is an acute need for affordably priced shelter on the island.

An analysis of the housing market, rental housing in particular, illustrates that the supply is low while demand continues to rise.

VI. DESCRIPTION AND ANALYSIS OF HOUSING IN THE MARKET

Since the project is categorized as attached housing, the study will focus on this type of dwelling. Our analysis of household types and sizes will employ housing statistics provided by the City and County of Honolulu's Department of Budget and Fiscal Services' Real Property Assessment and Property Assessment Division.

The majority of the attached housing stock on the island is old. The table shows that 60% of the attached dwellings on Oahu were built before 1980.

DESCRIPTION OF THE HOUSING STOCK ISLAND-WIDE: As seen below, most of Oahu's condominium housing stock is quite old:

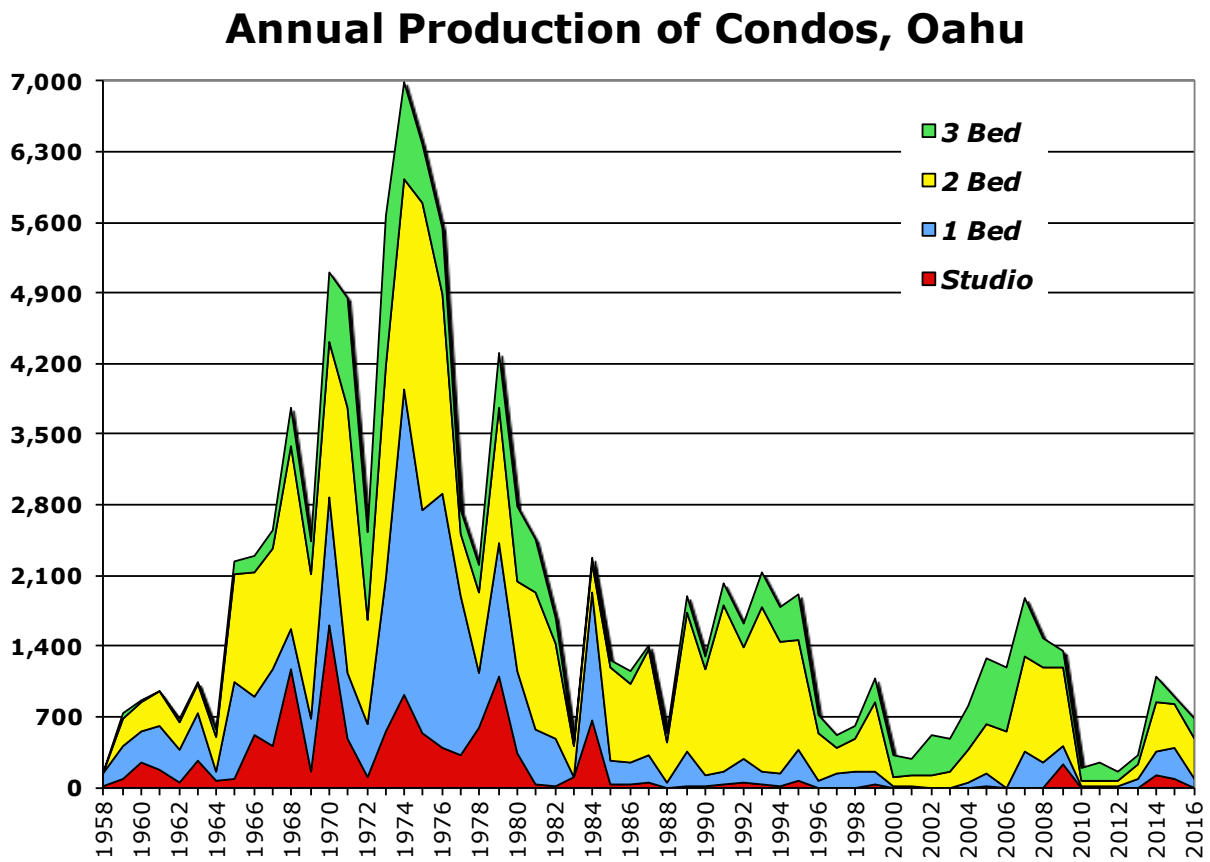
TABLE ONE: ATTACHED HOUSING INVENTORY, BY YEAR OF PRODUCTION ON OAHU

Year Unit Built	Unit Counts	Ave Int. Sq. Ft.	Ave Assessed $
<1955	289	503	$346,326
1955-1959	2,429	589	$449,458
1960-1964	4,867	618	$410,882
1965-1969	13,088	721	$415,926
1970-1974	25,730	803	$387,334
1975-1979	21,326	714	$379,057
1980-1984	9,847	815	$426,401
1985-1989	6,440	834	$427,274
1990-1994	8,859	917	$448,083
1995-1999	4,605	826	$524,536
2000-2004	1,836	1,143	$594,289
2005-2009	7,024	1,062	$833,913
2010-2014	2,050	1,056	$892,611
2015-2019	1,590	891	$586,329

Honolulu County Real Property Assessment and Property Assessment Division

As seen:

- Production of attached housing has plummeted since the 2005-2009 period
- The average size of the units has fallen
- The assessed value of each unit has risen significantly



When examining the attached housing stock by bedroom count, one can see that it is comprised primarily of one and two-bedroom units.

TABLE TWO: ATTACHED HOUSING BEDROOM TYPES, ISLAND WIDE

	Units	Ave. Sq Ftg	Ave. Assessed Values	Ave. Values Per Sq Ft
Studios	8,439	361	$202,080	$561
1 Bed	23,800	582	$309,853	$533
2 Bed	45,103	882	$412,141	$467
3 Bed	16,882	1,245	$493,991	$397
4 Bed	1,623	1,517	$525,142	$346

Honolulu County Real Property Assessment and Property Assessment Division

The housing market of Honolulu (and the state of Hawaii) has been described by the federal Department of Housing and Urban Development (HUD) as having one of the lowest percentages of home ownership in the nation. HUD also has declared it is among one of the least affordable housing markets. Such can be attributed to the limited supply of land, very high costs of production and very strong housing demand, resulting in low housing production and high prices. The problem is exacerbated by the fact that housing prices have exceeded household incomes for over 25 years.

Given high demand and low supply, the large numbers of low- to moderate-income households currently have very few options for housing. Further, this condition has existed for over 25 years, since the implementation of land zoning regulations at the county level (supply constraints) and the dramatic rise in the price of housing, fed by the Japanese visitor and housing demand explosion. These conditions, high prices and low supply, continue on today, with Honolulu being named as the least affordable housing market in the nation in a number of studies.

For instance, in 2016, Hawaii ranked #1 in the nation for having the widest gap between wages and the price of rental housing by The National Low-Income Housing Coalition's annual report, Out of Reach. It showed that in 2016,

the national Housing Wage is $20.30 for a two-bedroom rental unit, assuming a 40-hour workweek, 52 weeks per year. In comparison, Hawaii's Housing Wage was $32.44 for a two-bedroom rental unit.

HOUSEHOLD CONDITIONS, SIZE AND OWNERSHIP: There are several major effects of high housing costs on the communities. They include having a high number of homes with a large counts of bedrooms (a.k.a., monster homes), homes that have auxiliary dwelling units on property (ohana homes, backyard cottages, converted garages), and families that rent out part of their home to friends or family. The US Census measures evidence of this, and they define crowding as 2 or more persons per bedroom.

They also measure doubling up via surveys and define that as 'more than one family group' in a household. In the Hawai'i Housing Planning Study 2016, commissioned by the Department of Land and Natural Resources, such a survey was performed and the results from Oahu show the following:

TABLE THREE: CROWDING & DOUBLING UP, ALL OAHU HOUSEHOLDS SURVEYED

	Owners	Renter
Crowded	5.00%	21.60%
Doubled up	12.30%	10.70%
Crowded & Doubled Up	16.50%	26.80%

Hawai'i Housing Planning Study 2016

The following tables show the data by area.

TABLE FOUR: HOUSEHOLDS DOUBLING UP, BY AREA

	Ewa	Central Oahu	Waianae	Honolulu	Total
Yes	4,495	4,096	2,298	18,378	37,778
No	25,875	34,182	9,368	142,836	279,681

Hawai'i Housing Planning Study 2016

TABLE FIVE: OAHU HOUSEHOLDS CROWDING, BY AREA

People / Bedroom	Ewa	Central Oahu	Waianae	Honolulu	Total
Less than 2	27,880	35,445	10,091	137,354	281,269
More than 2	2,490	2,833	1,575	23,860	36,190

Hawai'i Housing Planning Study 2016

Another way that this condition is made apparent is the measurement of household size. Indeed, as households cannot afford housing, then over time pent-up demand increases, household formation is delayed, and the average household size grows. The statewide average for household size increased by 2.8% from 2.88 persons per household to 3.11. This is consistent with a housing market where demand was greater than supply. The following table shows that Oahu had highest increase in average household size over the 10-year period.

TABLE SIX: HOUSEHOLDS DOUBLING UP & CROWDING, BY AREA

	Population Growth	Household Growth	Housing Size Growth
Hawaii	19.1%	17.0%	0.3%
Honolulu	10.9%	3.5%	8.8%
Kauai	14.3%	11.7%	2.3%
Maui	19.3%	12.5%	5.8%

Hawai'i Housing Planning Study 2016

VII. DESCRIPTION AND ANALYSIS OF RENTAL MARKET

RENTAL HOUSING MARKET HISTORY: As recently as 50 years ago, Oahu was primarily an agrarian economy, and thus an agrarian society – this meant that the population was well dispersed to all ends of the island, mainly to the outlying plantation areas. And the plantation workforce was housed on the plantation for free, or for a nominal fee.

As such, there was no need for rental housing in these times. Additionally, there was little need for rental units in the urban core – many residents lived in the shadow of the sugar mill or the pineapple factory. The urban core that was there was centered on the business district and around Honolulu harbor.

With the advent of the jet airplane, a broad-based resort community took hold on the south shore of the island in Waikiki. There simultaneously grew a need for the resort workforce to reside near work. Thus, there was immigration from the plantation towns into Honolulu, starting in the 1960s.

This was seen in the housing supply (production) trend data, with very low levels of attached housing development prior to 1964. With the advent of tourism, coupled with the demise of agriculture, there was a boom in the production of this form of housing. As a result, the inventory, or housing stock, soared for the next fifteen years.

Thus, the urban core of the city began to be populated with apartment buildings and low-rise condos. Indeed, most multifamily development that was targeted on local residents was small-scale and done by small landowners on small land parcels. This can be seen today in the predominance in the marketplace of two-story walk-ups, most commonly located in and around Moiliili, Kapahulu, Makiki and Kaimuki. Then, the next most predominate form of multifamily housing was the six to eight story condominiums around Makiki and downtown.

Finally, there was a third type of multifamily housing – the town homes in Central and West Oahu, Mililani and Ewa that grew out of the skyrocketing housing prices that was part of the Japanese bubble cycle.

Note that the scale of the production of this attached housing was small: most of the attached housing development was on small parcels of land, and thus had few units. Part of the reason for this is a short supply of land, but also because the capital requirements for the development were small and so a group of local investors could finance it more easily. But one of the repercussions of this was that this marketplace is fragmented into many little buildings, and the ownership is spread out amongst many entities (think of it in terms of lots of mom-and-pop landlords).

Another reason why the rental housing market in Honolulu was slow to develop was that the ownership of land was concentrated in the hands of a very few entities, primarily companies or families who obtained their land directly from the crown or from the first owners (to wit: 22 landowners owned 72.5% of the fee simple titles in the island of Oahu).

In 1967, the Hawaii Legislature concluded that this was an oligopoly in land ownership, and it was “skewing the State's residential fee simple market, inflating land prices, and injuring the public tranquility and welfare,” and therefore enacted a condemnation scheme for title under the Hawaii Land Reform Act of 1967. As a result, a large number of leaseholds to fee-simple conversions took place in the 1980s and 1990s, mainly single-family units, but also multifamily units as well.

In retrospect, this forced conversion from leasehold to fee-simple ownership did nothing to alleviate the condition of shortage of buildable residential land on Oahu, but only increased the number of owners. Without more land to build on, the prices of housing stayed at a high level, with the additional problem being that the government owned about one-half of the land, which were originally crown lands.

This is a condition that exists still today, albeit a number of efforts by the federal, the state and county governments to use a portion of those lands for housing. Indeed, it would seem reasonable, particularly in the use of this land, to address the housing needs of the large numbers of society that are priced out of the market. However, in practice, the general public and their representatives are very resistant to allow public lands to be used constructively and profitably for housing shelter.

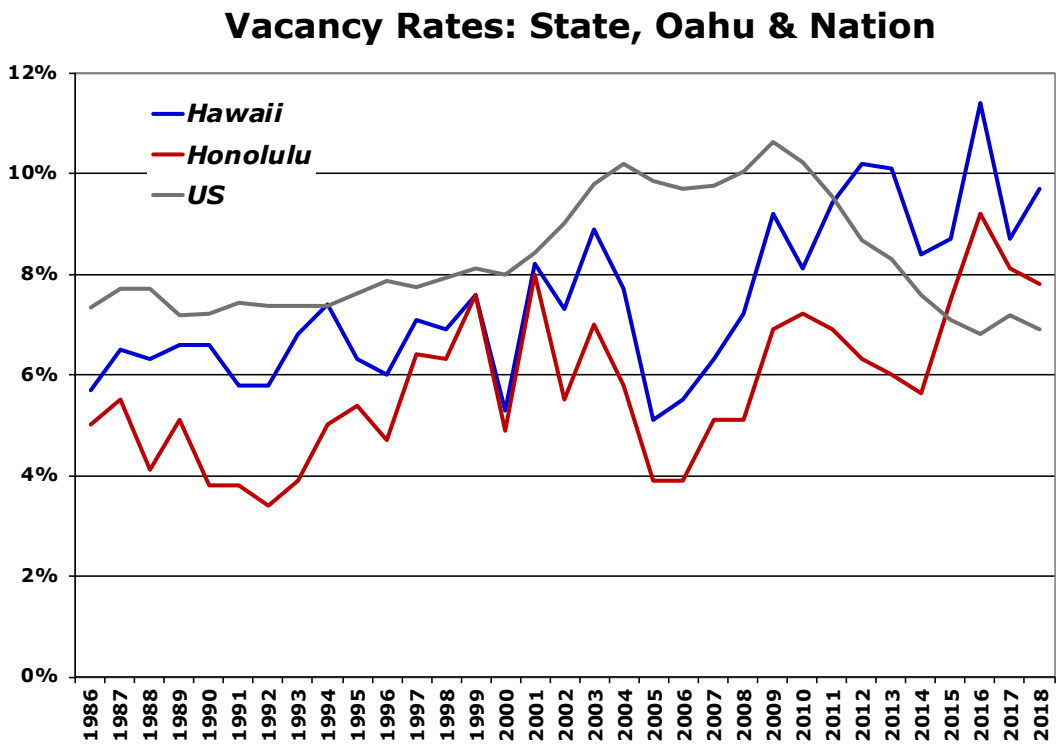
Ironically, this law and the demise of the leasehold system made it less likely that developers would produce attached housing at the middle and low end of the income spectrum, at least not without some form of subsidy. This was because building a large-scale housing development, as with high-rise apartments, was capital intensive – but, for all but the last decade of the 20th century, Hawaii was ‘capital-poor,’ and thus development depended on lenders from outside the state. With the leasehold rent system in place, this allowed for some certainty about future income streams, something with which offshore lenders (insurers in Massachusetts, for example) could feel comfortable.

This legacy carries down today, with Honolulu having a low rate of homeownership (relative to the rest of the nation), a high number of individually owned rental units and rental rates in market that are below prices that would encourage rental market development.

RENTAL MARKET CURRENT CONDITIONS: As previously stated, Honolulu is a small market with very few large rental operators and therefore data describing rental rates of specific projects is not readily available. There are, however, general sources that can be used.

U.S. Public Agencies

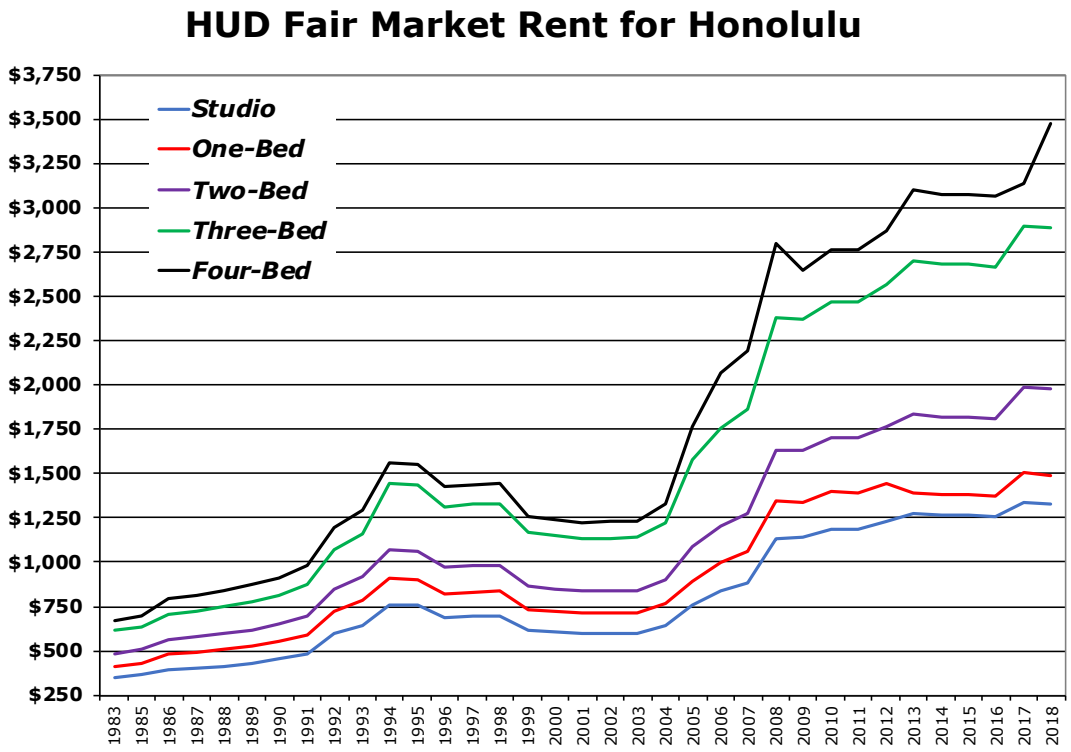
The U.S. Census has a plethora of data detailing housing market conditions on Oahu. The table below draws upon their Housing Vacancies and Homeownership data and illustrates the trend for the vacancy rate:



Note that the rates for Honolulu and the state used to be lower than that of the U.S. as a whole. However, that is not the case today – in the aftermath of the Great Depression, this rate has not returned to the levels it enjoyed during the 2005 top of real estate market.

This trendline flies in the face of logic, given high housing costs and extremely low unemployment, existing in Honolulu since 2010 every available unit should be occupied, not vacant. This anomaly leads to speculation that the Census data somehow captures the existence on Oahu of short-term rental units. There are a goodly number of such units, and they produce a very healthy cash flow, better say many landlords than long-term rentals. This should explain why there are such a large percentage of 'vacancies.'

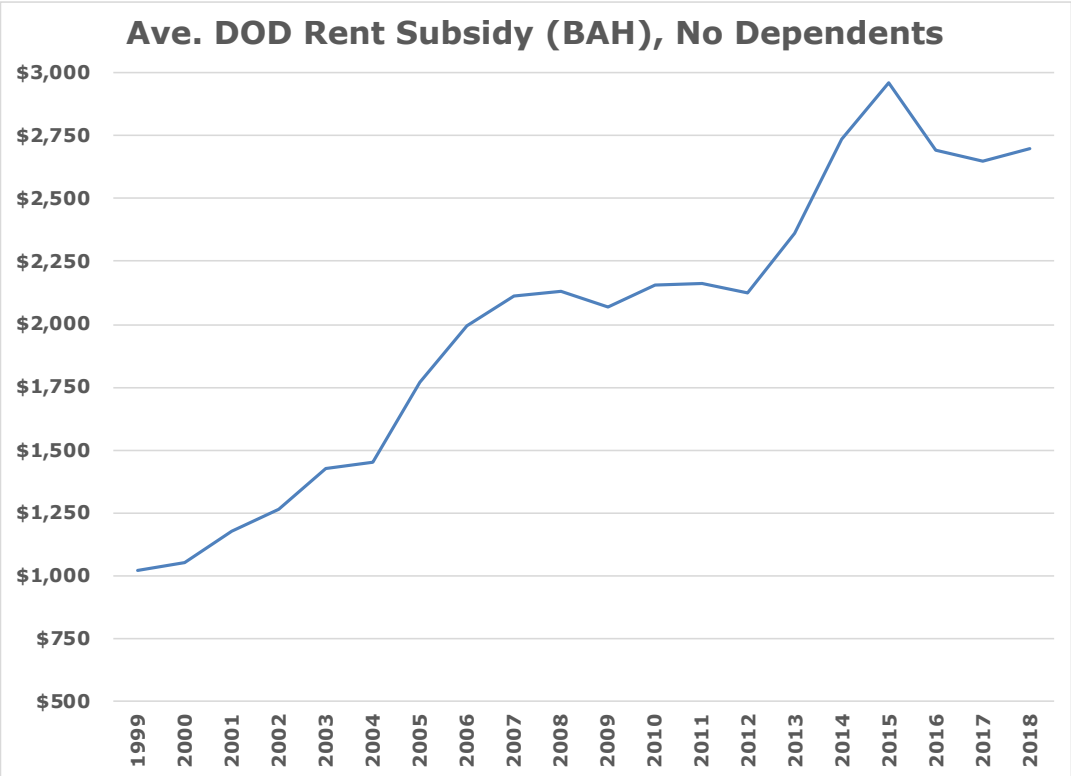
Turning to an examination of the actual rental rates being charged in the market, the best known one is called "Fair Market Rents" (FMR) and comes from the US Housing and Urban Development department (HUD). Every year, HUD analyzes the rental markets across the country, and then publishes a set of gross rent estimates for an area. They include the shelter rent plus the cost of all tenant-paid utilities, minus conveniences, like telephone and Internet. HUD does so by using (to quote them) "the most accurate and current data available" – per(http://www.huduser.org/datasets/fmr.html) - and this data includes the 2010 US Census data, the last American Community Survey (ACS) data, and telephone surveys of eligible recent rental unit movers.



As seen, the HUD-defined rents for the county accelerated in 2004 to 2008, before flattening out dramatically. This appears to be an anomaly, as the years since 2011 saw the economy and the residential real estate cycle rising, both for prices and closings in the for-sale market. This is contrast is that this writer has little faith that these HUD manufactured rates reflect rental market conditions (inasmuch as they don't track residential for-sale unit pricing trends, nor the economic trends, like jobs, taxes, visitor arrivals, etc.).

One possible explanation for this here, and repeating later, that two of these data sources – ACS and Census - are static, done every few years. The other one is that their methodology is not very accurate: telephone surveys of people moving in and out of units done randomly, are not very reliable, especially in non-urban areas, non-English speaking areas, and areas where there is a high turnover in rental units, such as vacation destinations. As such, the trends of the FMR do not match up with those rental trends from other sources, as seen.

Another source of rental trend information comes from the Department of Defense (DOD). It is called the Base Allowance for Housing (BAH), and it is their description of the rental market rates, done in conjunction with providing their personnel based in the county with a rental allowance. This is done for all counties where military personnel are based and adjusted for a cost of living. The following chart shows the average allowance that the military provides to its households when stationed in Oahu, in this case. As seen, the DOD allowance has moved in an opposite direction to the Fair Market Rent trend for Oahu for the same period (which is curious, looking at the spike up and down the last 3 years).



As seen, these two government agencies have differing views on the trend and the level of rental rates. And note, that this data's historical trend is cohesive with the Zillow and the Website trend.

Given that, rental housing research and researchers have used publicly available data on rental rates to describe the market place. Historically, the best source, in terms of depth, breadth and consistency, was classified advertising in the local newspapers. The listings here provided a wealth of important data, such as asking rents, unit size, unit location, unit features, unit restrictions, etc. This data, when collected over time, then allowed for research to show rental rate and unit availability trends, and do so by location, bed count, rents and other features.

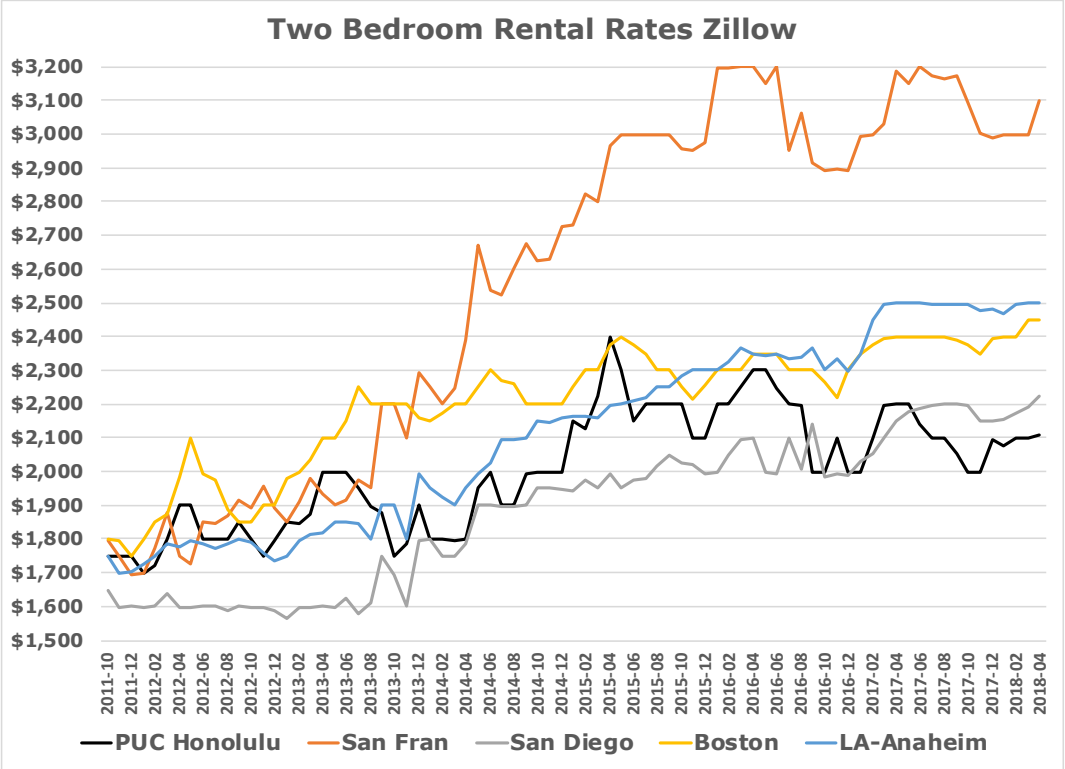
However, the advent of the internet disrupted the classified advertising marketplace by allowing that activity – and information - to migrate from a hard copy print in a newspaper into an electronic data held within a website. Thus, the research done using newspaper classified waned while that done using Internet websites that specialize in rental units in the area.

One that provides rental information most comprehensively is Zillow.

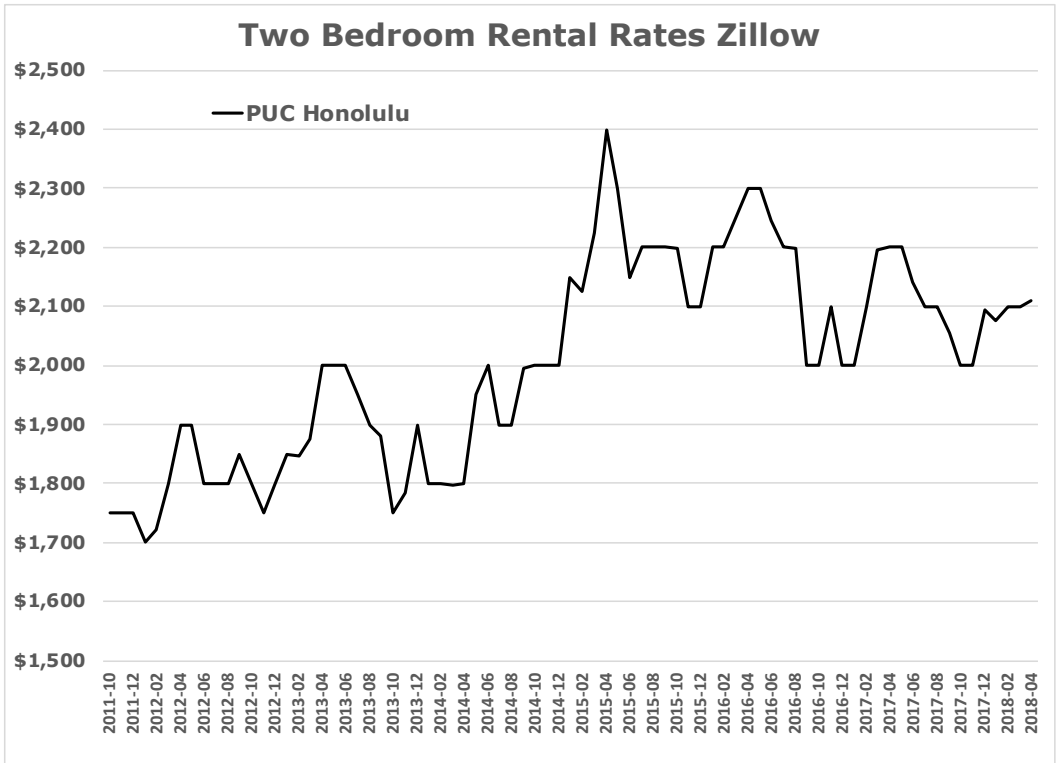
Zillow Data

Zillow Group is an online real estate database company that was founded in 2005 by former Microsoft executives. In addition to giving value estimates of homes, it offers several features including value changes of each home in a given time. Where it can access appropriate public data, it also provides basic information on a given home, such as square footage and the number of beds and baths. In December 2009, Zillow expanded its services to include the rental market. The addition of rental listings enabled users to list a home for rent and search for both rental homes and homes for sale.

Zillow rental data consists of listings, listing prices, estimated listing prices per square foot, and can be segmented by county, zip code, city and neighborhood. it breaks the data out by property type – homes vs. condos vs. apartments – it does not allow one to combine townhomes, condominiums and apartments. As such, it is a good tool for looking at the market overview, but not a good one for making fine distinctions and comparisons between the properties in that data.



As seen, the trend is rising, albeit in a volatile fashion.



Website Data

The best data, in terms of detail and comprehensiveness, can be drawn from the internet, from sites such as Craigslist and the Honolulu Board of Realtors (HBR). We isolated the data just for attached housing (including townhomes, condominium and apartments).

OVERVIEW: We start with an overview of the data, but just the listings that were rented out (with their rented price), and that were partially furnished (which was the largest category numerically – the others were not furnished, fully furnished and negotiable). The other data selection was to exclude single family homes and duplexes, but to lump together town homes, apartments and condos.

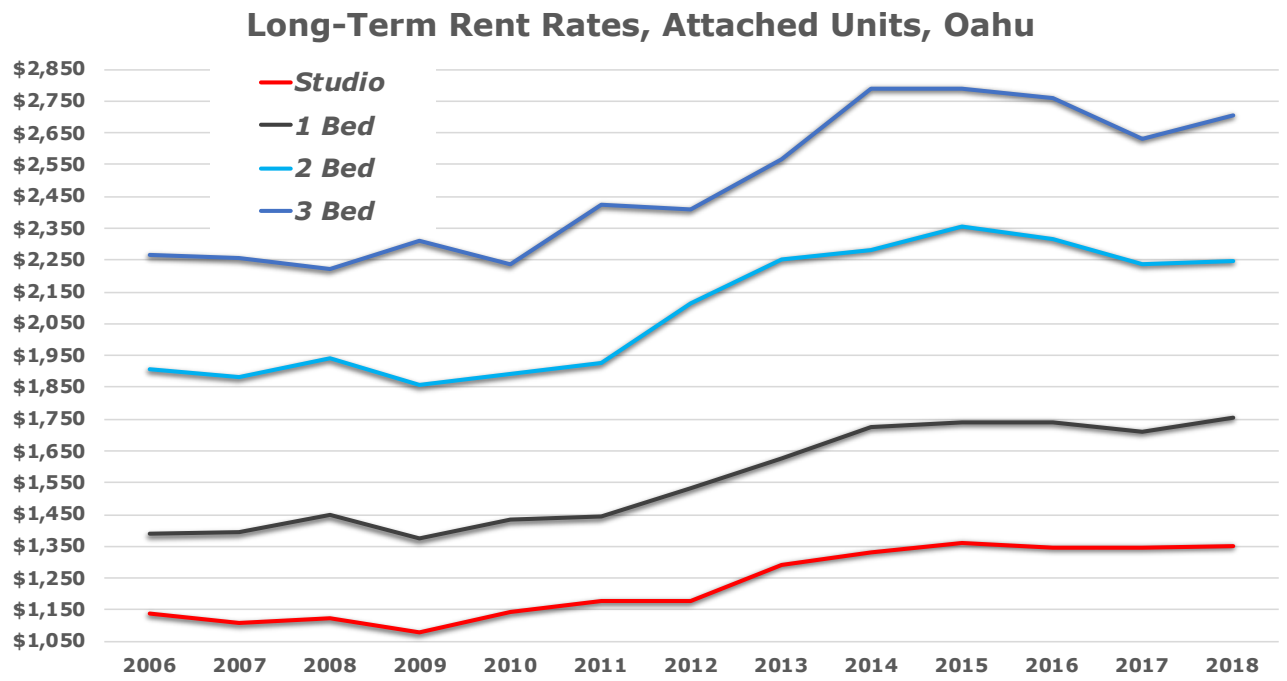
TIME FRAME 2008-2018: The following table gives an overview of the attached housing (including townhomes, condominium and apartments) database, all listings since 2008 by area and by bed counts. Note that this property sits in the TMK Zone 1-9, Ko Olina to Mililani to Aiea.

TABLE SEVEN: ALL LISTING COUNTS, FOR ATTACHED DWELLING UNITS, 2008-2018

TMK	Zone1	Studio	1 Bed	2 Bed	3 Bed
1-1	Salt Lake - Downtown	149	494	1,013	236
1-2	Downtown - Waikiki	2,251	5,584	5,659	637
1-3	D Head/Kaimuki - H Kai	169	642	1,204	439
1-4	Waimanalo - Hauula	34	265	944	527
1-5	Hauula – Sunset Beach	43	46	14	8
1-6	Waimea - Mokuleia	3	104	132	5
1-7	Wahiawa	19	99	157	15
1-8	Makaha - W Oahu	81	193	142	53
1-9	Ko Olina - Pearl City	296	1,209	4,954	2,165
	TOTAL	1,312	4,953	9,541	2,918

Website Data, 2008-2018

The following chart shows the average rents per bed for all multifamily rentals for the past 10 years.



Website Data, 2008-2018

VIII DESCRIPTION AND ANALYSIS OF OVERALL HOUSING DEMAND:

Numerous factors affect the demand for housing, the primary being population, household formations and job creation.

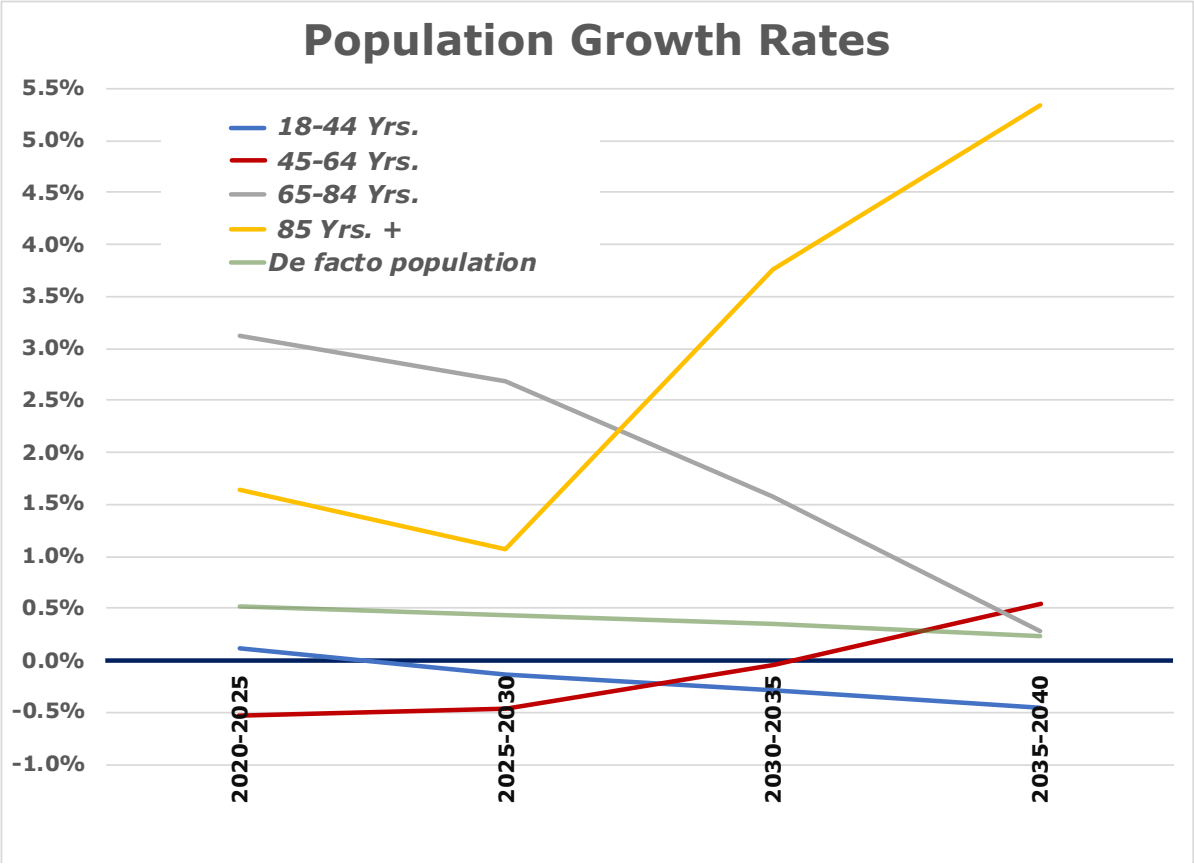
In the long run, population growth is the most important determinate of housing demand – although, for Hawaii, housing demand has a strong offshore component. The following table shows population projections by DBEDT for Oahu, pulled from their 2045 Series of the DBEDT Population and Economic Projections.

TABLE EIGHT: PROJECTED HONOLULU POPULATION TRENDS

	2020	2025	2030	2035	2040
Total resident population	**1,010,123**	**1,032,705**	**1,050,077**	**1,062,059**	**1,069,269**
Population: 0 to 4 years	68,086	69,898	67,117	64,182	62,606
School age children: 5 to 11 years	83,577	86,260	91,316	87,850	83,716
School age children: 12 to 13 years	22,332	23,769	24,516	24,989	23,901
School age children: 14 to 17 years	39,842	41,043	40,320	46,034	44,945
Population: 18 to 44 years	375,683	373,036	367,712	359,283	352,327
Population: 45 to 64 years	235,770	230,332	229,785	236,088	250,365
Population: 65 to 84 years	154,087	175,938	190,301	193,048	190,661
Population: 85 years and over	30,748	32,428	39,011	50,584	60,748
De facto population	**1,070,437**	**1,093,992**	**1,112,667**	**1,125,876**	**1,133,609**

2045 Series of the DBEDT Population and Economic Projections

The changes projected over the next 20+ years are shown in the chart below. Clearly, the projected growth in assumed demand in the next ten years is in the senior component of the population.



2045 Series of the DBEDT Population and Economic Projections

In the shorter run, it is the creation of jobs that is the most important stimulant for housing demand, as it leads to in-migration (meaning population growth and household formation).

Currently, job creation (as well as income generation, mainly wages) in the island economy is very strong. The table below comes from data sourced from DBEDT's monthly economic indicators, and it shows that the rate of unemployment has been steadily falling since 2009-2010. This rise in job creation coincides with the rise in hotel occupancy as well as hotel room rates. Note that it is in synch with the general excise tax trend, which is an indicator of overall business activity.

TABLE NINE: SELECTED HONOLULU ECONOMIC TRENDS

	Unemployment Rate	Hotel Occupancy	Hotel Room Rates	Ave GE Tax ($000)
1995	4.6%	80%	$102	$97,433
2000	4.1%	76%	$115	$110,441
2005	2.8%	86%	$139	$158,946
2010	6.0%	78%	$150	$168,270
2011	5.9%	81%	$150	$187,260
2012	5.4%	85%	$165	$203,370
2013	4.4%	84%	$183	$208,946
2014	4.1%	85%	$207	$213,399
2015	3.4%	86%	$211	$227,377
2016	3.1%	87%	$221	$231,377
2017	2.2%	89%	$241	$236,538
2018	1.9%	89%	$242	$237,118

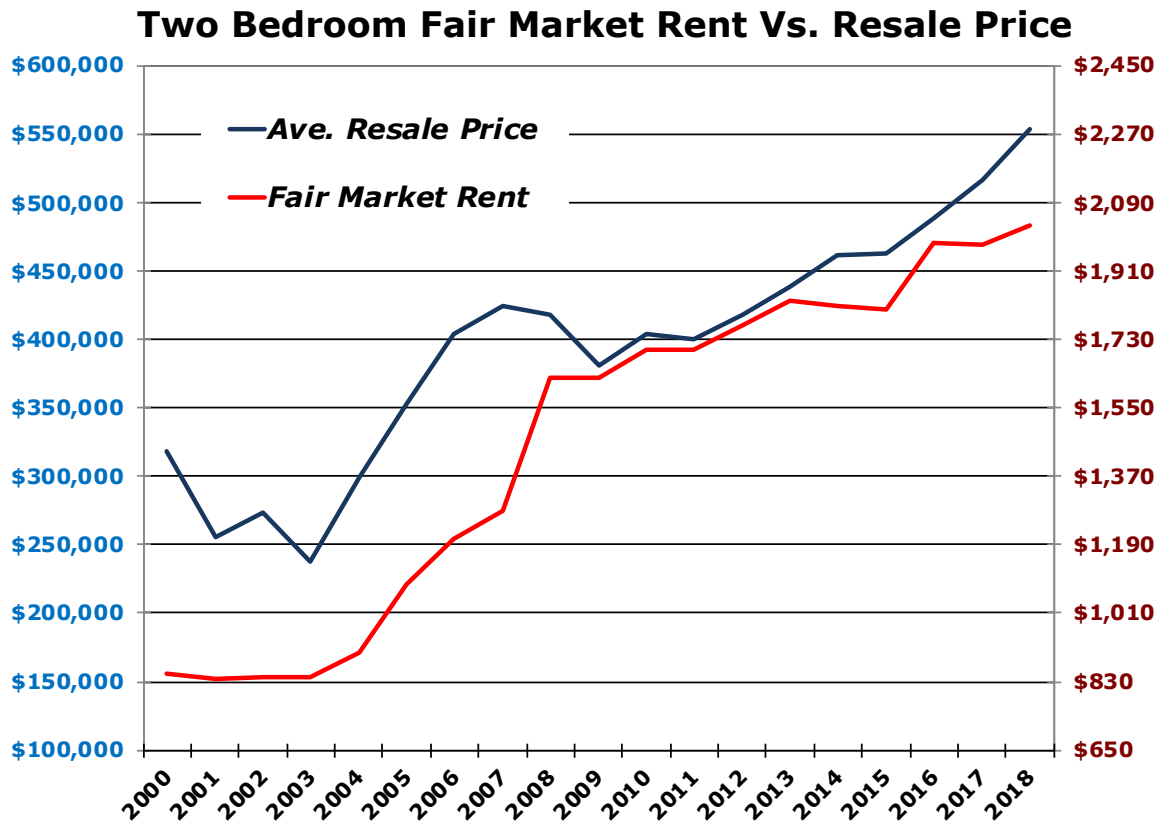
DBEDT Monthly Economic Data

Such growth in economic activity has led to growing demand for housing, both for-sale and for-rent units. In addition, this growth exerts pressure on for-sale prices and for-rent rental rates. This makes it more difficult for households with fixed or low-incomes to secure affordable shelter. There are other factors which serve to increase housing demand overall such as vacationers and military households.

CURRENT MARKET CONDITIONS: The condominium market is well into the upward swing of the housing cycle in terms of sales activity and price levels (data source is the MLS of the Honolulu Board of Realtors and the Bureau of Conveyances of the State). The last such swing started in 1998 and ended in 2005, ran for some 7 to 8 years and then had 4 to 5 years of falling sales and prices. It turned in 2011-2012, with a reversal of the trend for lower sales and prices, as demand grew at a time of shrinking inventory. Going forward, we foresee that this cycle's sales and price levels will run for the next several years and exceed the peaks of the last cycle.

This will negatively impact the rental market in a number of ways. Higher for-sale housing prices usually encourage landlords to sell to owner occupants removing rental units from the market. Also, higher housing prices paid by investors for rental units translate into higher rental rates to consumers, as the investor needs a higher cash flow.

The next chart illustrates how sale and rent prices are trending using MLS data for the resale prices and HUD Fair Market Rent data for the rental data. It shows that the prices paid for for-sale two-bedroom units serves as a leading indicator for rental prices for two-bedroom rental units.



While historically there has been a fairly close relationship between the average price of the 2-bedroom resale unit and the HUD given rate for Fair Market Rents on Oahu, it appears that the last 2 years, this rental rate trend has been lagging the resale price trend.

XI. DESCRIPTION AND ANALYSIS OF OVERALL HOUSING SUPPLY

OVERALL HOUSING: This table below is sourced from the earlier data on housing production from Honolulu's Department of Budget and Fiscal Services' Real Property Assessment and Property Assessment Division. It breaks housing supply, or production, down by unit size and the range of years it was supplied into the market.

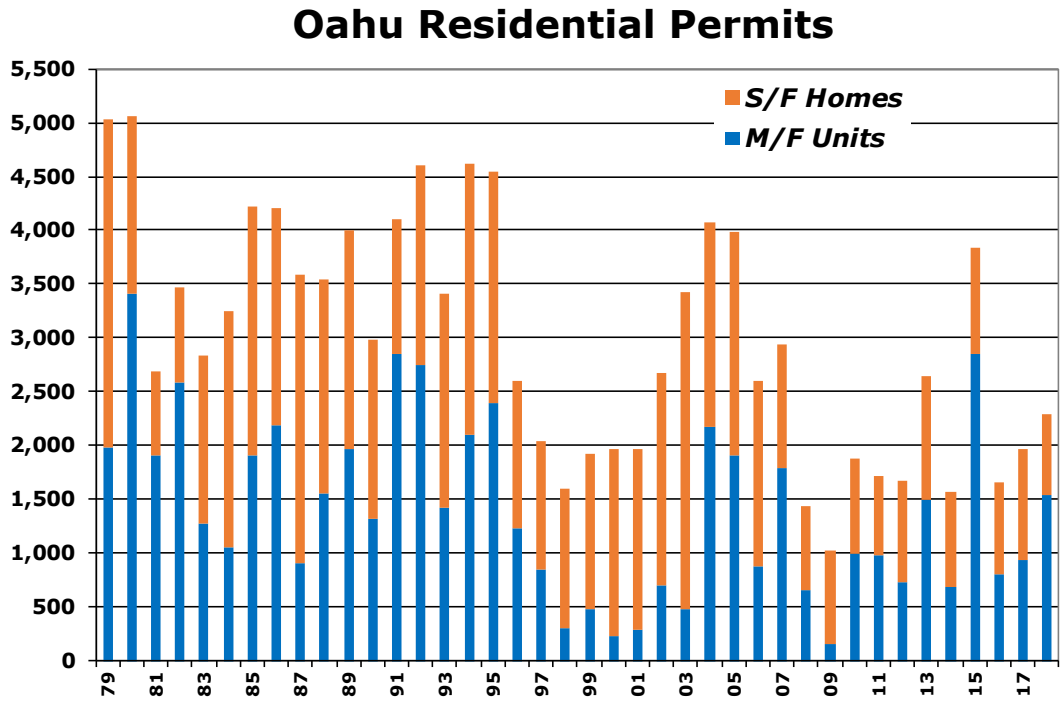
TABLE TEN: MULTI-FAMILY UNIT & UNIT SIZE PRODUCTION TREND

Year Built	Studio #s	1 Bed #s	2 Bed #s	3 Bed #s
<1955	40	196	50	1
1955-1959	291	1,380	683	72
1960-1964	989	2,051	1,681	138
1965-1969	2,175	2,980	6,634	1,201
1970-1974	3,656	6,993	9,426	5,077
1975-1979	2,842	8,141	7,746	2,278
1980-1984	1,161	3,170	3,904	1,571
1985-1989	142	1,155	4,613	527
1990-1994	131	729	6,734	1,262
1995-1999	107	766	2,804	914
2000-2004	-	80	752	981
2005-2009	233	902	3,726	2,139
2010-2014	126	348	809	738
2015-2019	90	403	812	283

Note how the production of studios and one bed have declined over time.

SPECIFIC SUPPLY IN NEAR TERM – PERMITS: The easiest way to look ahead to where the housing market is going in the short-term is by examining the activity in permits (where developers apply for permission, and pay their fees, for building residential units) from US Census data. A high level of activity indicates more supply, which means that more demand will be met, and the potential for prices adjusting downwards. Obviously, a low level of permits indicates less supply of housing (and potentially higher prices).

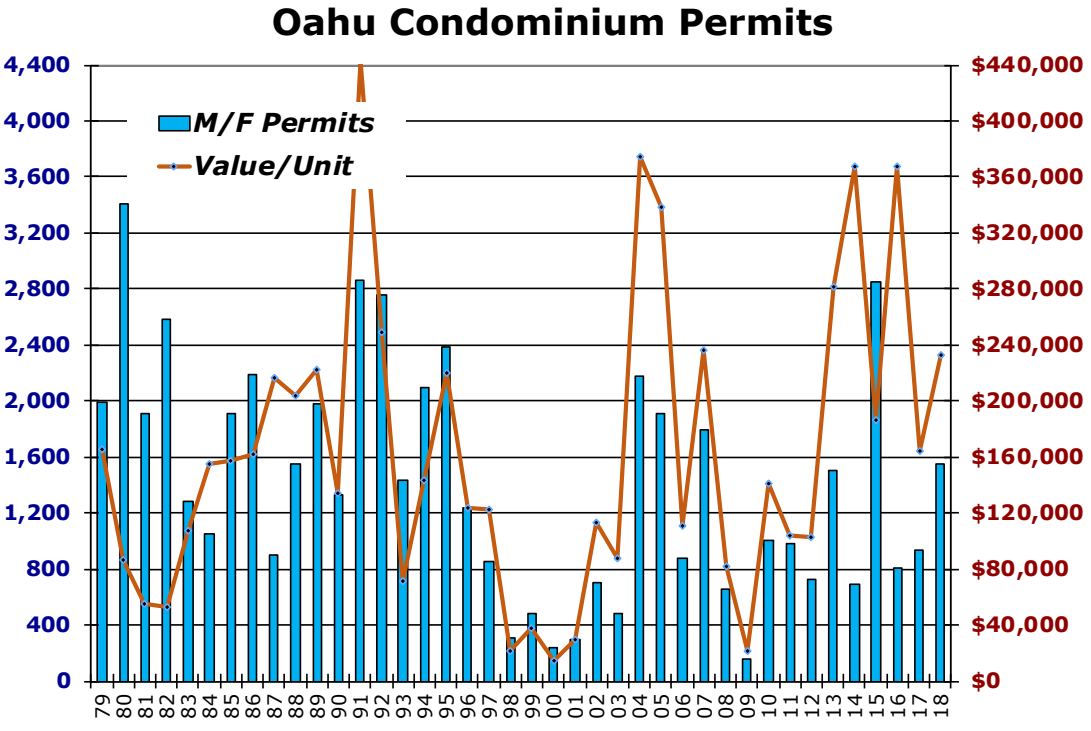
It should be noted that the long-term trend for permits – 1976 to 2018 (data through June), over 30 years is downward. This is a function primarily of restrictive land use laws, which started in the 70s, and took hold thereafter. Indeed, this restriction in the supply of land, nominally done in order to promote good planning, has acted also to raise the price of housing. It has done this by raising the cost via a limitation of supply, as well as via making the process of entitling land more time consuming, costlier and particularly riskier.



US Census

Further, the ensuing high cost of land has caused development, when conditions are right, to be focused on the most profitable segments of the housing market. For Honolulu, this is the high end of the buyer demand.

This fact is evident in the trend in the average dollar value per permit, shown in the next chart. For condos, as seen, it is almost always over $100,000 (which translates to a unit price of 3-4 times that amount).



US Census

PUBLIC RENTAL HOUSING STOCK: This section describes the public housing stock, or inventory, on the island of Oahu. Currently, there are over 4,500 affordable rental units in the Central and West Oahu DPA, which includes Ewa/Kapolei/Aiea. As seen, about 3,000 of these are family rentals. The tables below show the overview of that housing stock, and then provide a number of segmented tables.

TABLE ELEVEN: PUBLIC RENTAL HOUSING FOR FAMILIES BY AREA

Area	Units	Ave sf	Ave Rent
Central Oahu	651	771	$1,291
Ewa	24	647	$1,062
Halawa	222	785	$1,771
Kapolei	713	840	$1,024
Pearl City	120	693	$1,486
Waipahu	722	739	$1,414
West Oahu	494	719	$1,360
	2,946	782	$1,210

Proprietary Data

TABLE TWELVE: PUBLIC RENTAL HOUSING FOR SENIORS

Area	Units	Ave sf	Ave Rent
Central Oahu	441	453	$826
Kapolei	442	594	$912
Pearl City	335	457	$862
Waipahu	293	559	$980
West Oahu	74	441	$931
	1,585	504	$879

Proprietary Data

The next table breaks these numbers out by area median income, or AMI. As seen, there are hundred and 15 projects total that are family units.

TABLE THIRTEEN: PUBLIC RENTAL HOUSING FOR FAMILIES BY AMI

AMI	Projects	Units	Ave sf
30%	19	102	760
50%	38	874	764
55%	3	52	806
60%	30	856	815
75%	1	30	790
80%	22	708	768
100%	2	324	940
Grand Total	115	2,946	782

Proprietary Data

TABLE FOURTEEN: PUBLIC RENTAL HOUSING FOR SENIORS

AMI	Projects	Units	Projects	Ave sf
30%	6	54	54	503
50%	13	814	814	467
60%	12	717	717	545
Grand Total	31	1585	1585	504

Proprietary Data

TABLE FIFTEEN: PUBLIC RENTAL HOUSING FOR SENIORS BY BED COUNTS

Bed Count	AMI	Units	Ave sf	Projects
0 (Studio)	50%	231	414	2
	60%	178	488	3
0 Total		**409**	**458**	**5**
1 Bed	30%	33	453	5
	50%	583	477	11
	60%	537	541	8
1 Total		**1,153**	**493**	**24**
2 Bed	30%	21	750	1
	60%	2	750	1
2 Total		**23**	**750**	**2**

Proprietary Data

TABLE SIXTEEN: PUBLIC RENTAL HOUSING FOR FAMILIES BY BED COUNTS

Bed Count	AMI	Units	Ave sf	Projects
0 (Studio)	30%	4		1
	60%	20		1
0 Total		**24**		**2**
1 Bed	30%	5	637	4
	50%	269	597	11
	55%	6	622	1
	60%	51	652	5
	80%	126	544	4
1 Total		**457**	**604**	**25**
2 Bed	30%	89	697	10
	50%	499	728	18
	55%	26	744	1
	60%	573	760	13
	75%	30	790	1
	80%	346	720	9
	100%	93	882	1
2 Total		**1,656**	**732**	**53**
3 Bed	30%	4	1,072	4
	50%	106	1,014	9
	55%	20	1,051	1
	60%	212	949	11
	80%	236	936	9
	100%	231	998	1
3 Total		**809**	**980**	**35**

Proprietary Data

The last table describes the existing projects in this area.

TABLE SEVENTEEN: FAMILY RENTAL PROJECTS BY UNITS, AVERAGE SIZE AND RENT

Area	Projects	Units	Ave sf
Central Oahu	Courtyards Mililani Mauka	48	850
	Hibiscus Hills	51	746
	Kalani Gardens S236	95	854
	Kalani Gardens S8	24	854
	Kauhale Nani	50	750
	Kawahi Maluwai	118	700
	Makana Hale	98	775
	Manana Gardens	71	746
	Wahiawa Terrace	52	725
	Whitmore Circle	44	644
Ewa/Pearl City	Hale Kuha'o Weinberg-ADA Preference	24	647
	Hale Laulima	36	832
	Hale Mohalu II	84	600
	Jack Hall	144	
	Kekuilani Courts	80	790
	Kekuilani Gardens/USDA	55	790
	Ko`oloa`ula P1	104	
	Mokuola Vista	69	641
	Oasis At Waipahu	406	921
	Palehua Terrace 1	83	928
	Palehua Terrace 2	57	863
	Puuwai Momi	222	785
	Villages Moa'e Ku P1	63	863
	Villages Moa'e Ku P2	75	806
	Villages Moa'e Ku P3	36	809
	Villas at Aeola	81	895
	Villas at Maluohai	72	
	Waipahu 1 (Pupuole Street)	19	734
	Waipahu 2 (Pupuole Street)	20	729
	Waipahu Towers	64	583
West Oahu	Hale Makana Nanakuli	47	853
	Hale Wai Vista I	84	641
	Hale Wai Vista II	132	631
	Kauiokalani	30	987
	Kulia I Ka Nuu	71	
	Palehua Terrace 2	7	778
	Waimaha/Sunflower	130	718
Grand Total		**2,946**	**782**

Proprietary Data

TABLE EIGHTEEN: SENIOR RENTAL PROJECTS BY UNITS, AVERAGE SIZE AND RENT

Area	Projects	Units	Ave sf
Central Oahu	220 California Ave (E)	41	403
	Laiola Elderly	108	445
	Meheula Vista	75	420
	Meheula Vista 2	75	420
	Weinburg Silvercrest	78	480
	Wilikina Park	64	553
Ewa/Pearl City	Ewa Village Elderly	84	600
	Franciscan Vistas	149	640
	Hale Mohalu II	163	432
	Hale Mohalu Senior	73	473
	Hale O'Hauoli	99	497
	Kamalu Hoolulu	221	521
	Senior Residence Kapolei	59	482
	Waipahu Hall	72	636
	West Loch Elderly	150	611
West Oahu	Keola Hoomalu	35	432
	Nanaikeola Senior Apts	39	450
Grand Total		**1,585**	**504**

Proprietary Data

X. DEMOGRAPHIC DESCRIPTION & ANALYSIS OF RENTAL HOUSING DEMAND

The subject area is Kapolei, and the subject property will be potentially be producing studios, one-, and two-bedroom and three- unit and four-bedroom unit rentals for those making anywhere from 30% to 80% of the Area Median Income (AMI).

This assumes that there will not be demand for units coming from the higher AMI of 100% plus, nor from market rate rentals. As seen, current market rents in the area sit above the rents that are mandated by the HHFDC affordable rental guidelines – thus, it is likely those households will not participate in an affordable rental unit project. This because they will pay less. And because they will not have to qualify their income and assets every year, as well as be able to rent units in other areas, including TOD rental developments closer to the major centers of employment, retail and recreational activities. Further, those making 100% of AMI have sufficient income to convert to home ownership, at least in a starter home built as attached housing.

This also assumes that there will not be demand for units coming from the open market in a mixed-use development. That assumption is based on the belief that most households who make sufficient income to rent a market unit operate on a different set of preferences than those not making that income. These include renting, as mentioned above, in a preferable location. Given that there will be a string of market rental unit developments along the rail line using the TOD enabled relaxed regulations, there will be strong growth of supply, and thus competition in this segment for market renters. Another preference would be to rent in a property whose neighbors exhibit similarities and preferences that they themselves possess, thus diminishing the depth of the demand for a mixed unit project in this location. This is not to say that some buildings on this land will not be either mixed use or market units exclusively, but rather to say that such demand will not be of significant strength, at least not within the first 7-10 years.

Here are the income limits of the household, as given by the HUD 2018 AMI definition. These tax subsidy income limits are described in the table below.

TABLE TWENTY: MULTIFAMILY TAX SUBSIDY PROJECT INCOME LIMITS, 2018

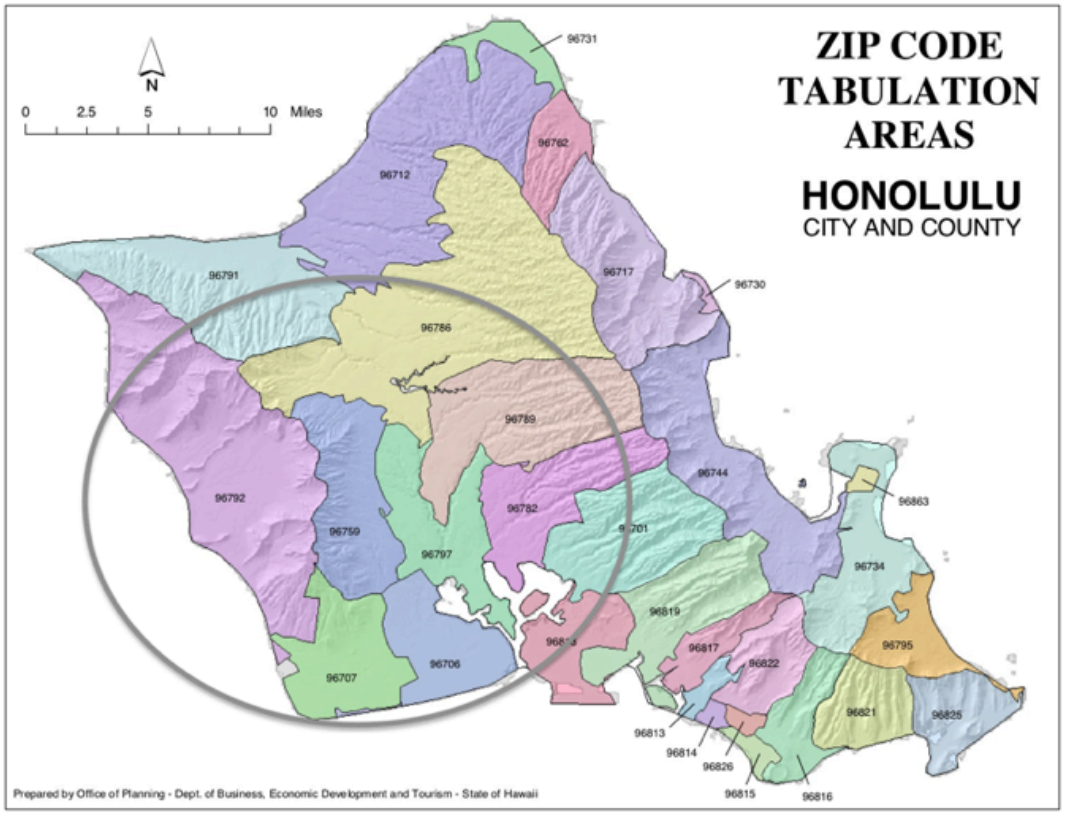
AMI	1 Person	2 Person	3 Person	4 Person	5 Person	6 Person	7 Person
30%	$24,510	$27,990	$31,500	$34,980	$37,800	$40,590	$43,380
50%	$40,850	$46,650	$52,500	$58,300	$63,000	$67,650	$72,300
60%	$49,020	$55,980	$63,000	$69,960	$75,600	$81,180	$86,760
80%	$65,360	$74,640	$84,000	$93,280	$100,800	$108,240	$115,680
100%	$81,700	$93,300	$105,000	$116,600	$126,000	$135,300	$144,600

HUD Data

Using the above guidelines, the table below depicts the total population of households in Kapolei area who are renting, categorized by income bracket according to the number of people in the household.

This data comes from Ribbon Demographics, a firm that specializes in taking US Census data and separating it into segments that are useful for projecting the demographic demand for affordable housing. It defines the relevant target markets of this project and does so for 2018 and for 2023.

The data set used above was filtered by location, specifically by zip codes. These zips were selected because they were in areas that were close to the project site, and thus would be attractive to renter households making below 100% of median income. The areas ran from Waianae to Pearl City, and Wahiawa to Ewa, as seen in the map.



TOTAL RENTAL MARKET DEMOGRAPHIC DEMAND: For the Kapolei Market Area, the following tables describe household demand by income range and household size. The data only includes those households identified in the 2010 Census as renters (and thus ignores those households who identified themselves as owning their shelter).

TABLE TWENTY-ONE: POTENTIAL DEMAND FROM ONLY KAPOLEI AREA RENTER HOUSEHOLD, 2018

Income Range	1-Person	2-Ppl	3-Ppl	4-Ppl	5-Ppl	6-Ppl	7+-Ppl	Total
$0-10,000	1,063	507	499	353	95	50	64	2,631
$10,000-20,000	1,132	600	421	279	207	108	139	2,885
$20,000-30,000	1,041	984	725	618	326	170	219	4,082
$30,000-40,000	820	1,158	756	802	336	176	226	4,273
$40,000-50,000	847	1,309	924	750	416	217	279	4,743
$50,000-60,000	746	950	572	650	246	128	165	3,458
$60,000-70,000	790	1,111	819	687	429	224	288	4,347
$70,000-75,000	395	556	410	343	214	112	144	2,174
$75,000-80,000	174	309	255	219	125	65	84	1,232
$80,000-90,000	392	695	574	493	282	147	189	2,772

Proprietary from Ribbon Demographics Data

As an aside, any household making above $90,000 a year has sufficient resources to purchase a house. The table below projected the likely price range that a household could make, assuming an interest rate and 5% down.

TABLE TWENTY-TWO: FINANCIAL CAPACITY TO PURCHASE A HOME, BY INCOME RANGE 2018 ($000)

Income Range	5% Down, 4.5% IR	5% Down, 5% IR
$20,000-30,000	$73-$159	$69-$150
$30,000-40,000	$159-$187	$150-$177
$40,000-50,000	$187-$245	$177-$231
$50,000-60,000	$245-$302	$231-$285
$60,000-70,000	$302-$359	$285-$339
$70,000-75,000	$359-$387	$339-$366
$75,000-80,000	$387-$416	$366-$393
$80,000-90,000	$416-$473	$393-$447

Proprietary from Ribbon Demographics Data

It shows that a family earning at the lower range of the highest income segment can afford to buy a home at $393,000 or lower. This is well within being able to purchase a unit at the median price in 2019 for an attached dwelling in Honolulu, or $330,000. Thus, we will be using the $90,000/year annual income as the top end of the income range in this study, going forward. As this income correlates to 100% of AMI, it is assumed that these households will more willing to buy a house than to rent. Thus, demand from this constituency is assumed to be immaterial to the supply of affordable rental units that will be produced on these lands.

Further, as seen in the next sections, the affordable rental guidelines for units targeted on those households making 80% of AMI or above are HIGHER than existing rents in the Kapolei area. Thus, it will be shown that these households are unlikely to be in the constituency for renting affordable units (as they would prefer to rent at lower rates and rent without the obligation to qualify for such units, based on their tax returns, W1 forms, etc.).

Note that this is total potential demand. It not additional demand to what is already existing. As such, the question could arise: Will any new supply or production on the subject of this study that was targeted upon households earning within the 30% to 80% of AMI meet with sufficient demand.

The answer swings on whether there is existing supply for this potential demand. And it is very unlikely that there is not, as the scale of the underhoused population on the island is very large, relative to supply. The island-wide data used for this study showed there were over 70,000 households, renter households, who made 60% of AMI or less. And there were another 50,000 households, owner households, making the equivalent. Against this, there are about 4,500 public rental housing units on the island.

Next, using the AMI guidelines, we translated this total potential demand within the area into the different ranges of AMI, and then derived the number of bedrooms this constituent population would demand, given their incomes.

There was some judgment used to derive potential demand for the three and the four-bedroom units, because a 4 and a 5-member household can qualify for both a three and a four-bedroom unit, under HUD rules.

TABLE TWENTY-THREE: POTENTIAL DEMAND, KAPOLEI RENTER HOUSEHOLD, 2018

AMI	Studios	One Bed	Two Bed	Three Bed	Four Bed	Bed Totals
30%	2,664	1,893	2,584	1,581	1,256	9,977
50%	1,465	1,957	2,556	1,844	1,188	9,009
60%	774	1,275	1,070	924	558	4,601
80%	1,186	2,047	1,834	994	732	6,794

Proprietary using Ribbon Demographics Data

Note that this is the potential demand for 2018, the most current year we have demographic demand for. It is also for all age groups, including Seniors, Students and Families. In subsequent sections, we will segment the data to those age groups.

Note that this is the potential demand for 2018, the most current year we have demographic demand for. We have a 5-year forecast from the same data supplier, and it's rendered below.

TABLE TWENTY-FOUR: POTENTIAL DEMAND FROM KAPOLEI AREA RENTER HOUSEHOLD, 2023

AMI	Studios	One Bed	Two Bed	Three Bed	Four Bed	Bed Totals
30%	2,865	1,739	2,087	1,337	1,131	9,159
50%	1,539	1,932	2,076	1,666	1,124	8,337
60%	832	1,175	1,015	842	604	4,467
80%	1,298	1,939	1,861	1,167	918	7,183

Proprietary using Ribbon Demographics Data

Note further, it is the potential demand for all age groups, including Seniors, Students and Families. In subsequent sections, we will segment the data to those age groups. Next, we will segment the data to those age groups, starting with the Seniors, age 60 years and above.

SENIOR RENTAL MARKET DEMOGRAPHIC DEMAND:

TABLE TWENTY-FIVE: POTENTIAL DEMAND FROM ONLY KAPOLEI SENIOR RENTER HOUSEHOLD, 2018

Income Range	1-Person	2-Ppl	3-Ppl	4-Ppl	5-Ppl	6-Ppl	7+-Ppl	Total
$0-10,000	614	158	69	50	16	8	11	926
$10,000-20,000	745	228	96	67	24	12	16	1,187
$20,000-30,000	423	337	95	69	52	27	35	1,039
$30,000-40,000	240	215	87	33	27	14	18	634
$40,000-50,000	218	297	120	121	66	34	44	900
$50,000-60,000	191	195	110	73	19	10	13	610
$60,000-70,000	145	214	120	102	43	23	29	677
$70,000-75,000	73	107	60	51	22	11	15	339
$75,000-80,000	47	65	26	18	13	7	9	184
$80,000-90,000	105	146	59	40	29	15	19	413

Proprietary using Ribbon Demographics Data

Using the AMI guidelines, we translated this potential area demand into the different ranges of AMI, and then again into the number of bedrooms this population would be demanding.

Note that this is the potential demand for 2018, the most current year we have demographic demand for. Note further, it is the potential demand for all age groups, including Seniors, Students and Families. In subsequent sections, we will segment the data to those age groups.

TABLE TWENTY-SIX: POTENTIAL DEMAND FROM ONLY KAPOLEI SENIOR RENTER HOUSEHOLDS, 2018

AMI	Studios	One Bed	Two Bed	Three Bed	Four Bed	Bed Totals
30%	2,664	1,893	2,584	1,581	1,256	9,977
50%	1,465	1,957	2,556	1,844	1,188	9,009
60%	774	1,275	1,070	924	558	4,601
80%	1,186	2,047	1,834	994	732	6,794

Proprietary using Ribbon Demographics Data

Note the 5-year forecast from the same data supplier, and it's rendered below.

TABLE TWENTY-SEVEN: POTENTIAL DEMAND FROM KAPOLEI SENIOR RENTER HOUSEHOLDS, 2023

AMI	Studios	One Bed	Two Bed	Three Bed	Four Bed	Bed Totals
30%	1,844	658	223	278	147	3,150
50%	584	408	214	290	141	1,638
60%	283	291	127	169	69	939
80%	365	415	194	189	124	1,287

STUDENT RENTAL MARKET DEMOGRAPHIC DEMAND

The following is the demographic data describing the incomes and count of people in a renter household in the Kapolei area, for household heads 25 years old or under.

TABLE TWENTY-EIGHT: POTENTIAL DEMAND KAPOLEI STUDENT DEMAND, 2018

Income Range	1-Person	2-Ppl	3-Ppl	4-Ppl	5-Ppl	6-Ppl	7+-Ppl	Total
$0-10,000	75	76	85	47	6	3	4	298
$10,000-20,000	45	47	23	47	14	7	9	192
$20,000-30,000	212	267	212	128	64	33	43	960
$30,000-40,000	56	202	113	136	43	22	29	600
$40,000-50,000	58	155	105	91	43	22	29	503
$50,000-60,000	36	88	66	95	35	18	23	361
$60,000-70,000	86	128	128	71	44	23	29	508
$70,000-75,000	43	64	64	35	22	11	15	254
$75,000-80,000	9	12	15	19	8	4	5	72
$80,000-90,000	20	28	34	43	18	9	12	163

Proprietary using Ribbon Demographics Data

Using the AMI guidelines, we translated this potential area demand into the different ranges of AMI, and then again into the number of bedrooms this population would be demanding.

Note that this is the potential demand for 2018, the most current year we have demographic demand for.

TABLE TWENTY-NINE: POTENTIAL DEMAND FROM STUDENT RENTER HOUSEHOLDS, 2018

AMI	Studios	One Bed	Two Bed	Three Bed	Four Bed	Bed Totals
30%	216	336	338	389	153	1,433
50%	177	327	217	354	196	1,271
60%	53	137	88	140	222	639
80%	81	227	182	108	196	794

Proprietary using Ribbon Demographics Data

Note the 5-year forecast is from the same data supplier, and it's rendered below.

TABLE THIRTY: POTENTIAL DEMAND FROM STUDENT RENTER HOUSEHOLDS, 2023

AMI	Studios	One Bed	Two Bed	Three Bed	Four Bed	Bed Totals
30%	224	338	313	327	170	1,371
50%	230	415	162	312	103	1,223
60%	47	106	55	108	46	362
80%	98	175	114	118	51	556

Proprietary using Ribbon Demographics Data

Of note here is that that the data is only for households that are currently renting, as opposed to those owning – and not owning - as having the potential for renting one of these units. The reader should keep in mind that there are current homeowners who would qualify, given their average income. However, since they probably will not relocate from their home to a rental unit, and they need to dispose of their ownership interest to qualify, they are not considered here. That said, they well could do so, particularly in the case of parents deeding their home to their children.

Given this - potential housing demand by AMI and preferred bedroom unit – we look at what the rents that can be charged. The following table describes the maximum rents that the HHFDC has determined for 2018 as being allowable by affordable rental unit landlords.

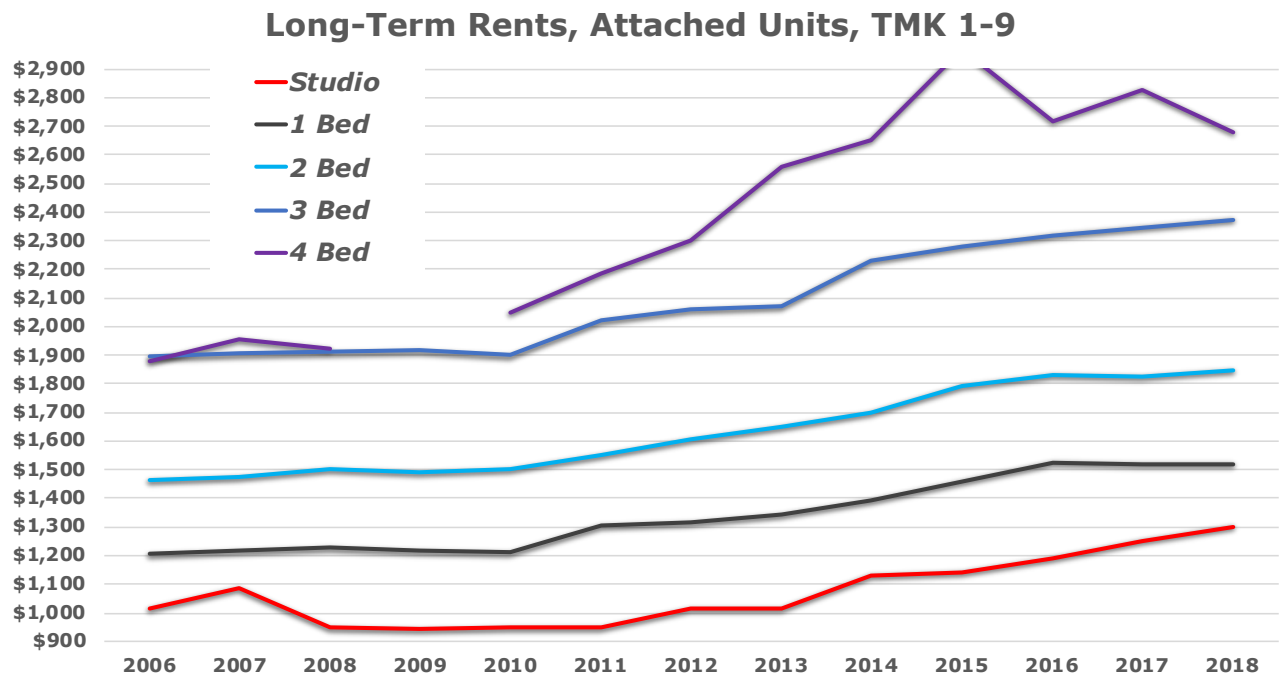
TABLE THIRTY-ONE: RENTER RATE LIMITS, HHFDC 2018

Beds	0 Bed	1 bed	2 bed	3 bed	4 bed
30%	$612	$656	$787	$909	$1,014
50%	$1,021	$1,093	$1,312	$1,516	$1,691
60%	$1,225	$1,312	$1,575	$1,819	$2,029
80%	$1,634	$1,750	$2,100	$2,426	$2,706
100%	$2,042	$2,187	$2,625	$3,032	$3,382
120%	$2,450	$2,624	$3,150	$3,638	$4,058
Market	$1,234	$1,516	$1,861	$2,373	$2,642

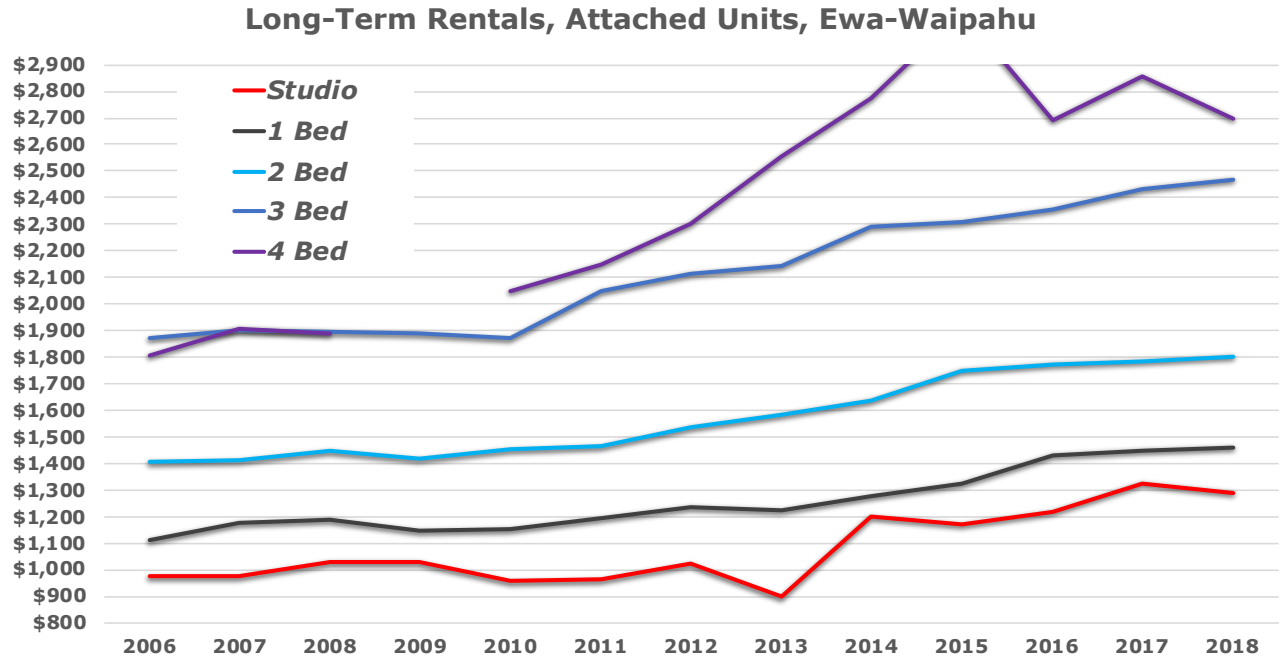
Note that the last line shows the market rents for Kapolei. These are the average rents existing in the target market area and will be described in the next section (as well as compared to the demographic demand).

XI. MARKET RENTAL RATES & ANALYSIS

The following tables use Craigslist & other website data. The first table shows the trend for rental rates for Long-Term (not short) units located within the target market area, TMK 1-9, which is for rental units in Central and West Oahu.



The next table shows a sub-set of this area data, and runs from the Ewa to Waipahu area, which includes Kapolei, Waikele and Kunia.



Next, we filtered the above data to just show the rents within the Kapolei area. This was done for the last 3 years and by bedrooms from 0 (studios) to 4 bedrooms.

TABLE THIRTY-TWO: RENT RATE TREND, 2016-2018

	0 Bed	1 bed	2 bed	3 bed	4 bed
2016	$1,183	$1,520	$1,846	$2,339	$2,917
2017	$1,247	$1,502	$1,834	$2,378	$2,800
2018	$1,234	$1,516	$1,861	$2,373	$2,642

Proprietary using website derived data

Of interest is how the rates are fairly stable, except for the studios and four-bedroom trend. This is because this is a thin market, with not a lot of units.

These rents were compared to the overall island average rents, and for 2018, the comparison showed there was about discount applied to the Kapolei area of between 11%-21%.

We also looked at the rental rates for units built just in the last 8 years, or since 2010. The table below provides that comparison, just for the 2018 year.

TABLE THIRTY-THREE: RENT RATE TREND, 2016-2018

	TMK 1-9 $	Kapolei, All	Kapolei, New
Studios	$1,227	$1,234	$1,200
One Bed	$1,517	$1,516	$1,667
Two Bed	$1,876	$1,861	$2,311
Three Bed	$2,544	$2,373	$2,888
Four Bed	$3,210	$2,642	$3,578

Proprietary using website derived data

Next, those rents are shown in comparison with the HHFDC Guidelines by AMI.

As seen, the market rents sit between the guideline rents for 60% and 80% of AMI (per the yellow highlight).

TABLE THIRTY-FOUR: RENTER RATE LIMITS, HHFDC 2018

AMI Guidelines	0 Bed	1 bed	2 bed	3 bed	4 bed
30%	$612	$656	$787	$909	$1,014
50%	$1,021	$1,093	$1,312	$1,516	$1,691
60%	$1,225	$1,312	$1,575	$1,819	$2,029
80%	$1,634	$1,750	$2,100	$2,426	$2,706
100%	$2,042	$2,187	$2,625	$3,032	$3,382
120%	$2,450	$2,624	$3,150	$3,638	$4,058
TMK 1-9 Rent	$1,227	$1,517	$1,876	$2,544	$3,210
Kapolei Rent All	$1,234	$1,516	$1,861	$2,373	$2,642
Kapolei Rent, New	$1,200	$1,667	$2,311	$2,888	$3,578

Another way to see this is to turn the table on its side:

TABLE THIRTY-FIVE: RENTER RATE LIMITS, HHFDC 2018

	50% AMI	60% AMI	80% AMI	TMK 1-9	Kapolei All	Kapolei New
Studios	$1,021	$1,225	$1,634	$1,227	$1,234	$1,200
One Bed	$1,093	$1,312	$1,750	$1,517	$1,516	$1,667
Two Bed	$1,312	$1,575	$2,100	$1,876	$1,861	$2,311
Three Bed	$1,516	$1,819	$2,426	$2,544	$2,373	$2,888
Four Bed	$1,691	$2,029	$2,706	$3,210	$2,642	$3,578

The tipping point appears to be between 60% and 80% of AMI. By this, it means that market rents are below what is mandated by the affordable rental guidelines. Essentially, the market's production today is taking care of households making above the 80% AMI. therefore "affordable housing" programs need only address those below 80% AMI in this geographic area.

Put another way, the only households unable to obtain units at market rents currently are those earning 30-60% of AMI (above the yellow shading). They constitute the demand for affordable units rented out at below market rates

in this location (households who will benefit units rented at the HHFDC guidelines, i.e., units rented out at below market rates).

This allows us to take the potential demand by bedroom count and decide what would be the likelihood that a household of a certain AMI would relocate into a new rental project in East Kapolei. The table below identifies the number of households in the different AMI ranges for rental housing.

TABLE THIRTY-SIX: DEMAND FOR ALL KAPOLEI, USING HHFDC 2018 RENTS DEFINITIONS

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	2,664	1,465	774	1,186
One Bed	1,893	1,957	1,275	2,047
Two Bed	2,584	2,556	1,070	1,834
Three Bed	1,581	1,844	924	994
Four Bed	1,256	1,188	558	732
Total	9,977	9,009	4,601	6,794

Proprietary using Ribbon Demographics Data

This allows us to make some assumptions about how many of these households would be strongly motivated to pay less rent, or the same amount, to relocate into a new project in Kapolei, near the rail station. That is embodied in a market capture rate. It is in the final line of the next table.

TABLE THIRTY-SEVEN: ALL KAPOLEI CURRENT YEAR RENTER DEMAND, BY AMI

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	2,664	1,465	774	1,186
One Bed	1,893	1,957	1,275	2,047
Two Bed	2,584	2,556	1,070	1,834
Three Bed	1,581	1,844	924	994
Four Bed	1,256	1,188	558	732
Total	9,977	9,009	4,601	6,794
Market Capture %	95%	50%	33%	10%
Potential Demand	9,479	4,504	1,518	679

Proprietary using Ribbon Demographics Data

Note that our Market Capture rate is very high for 30%, and then declines. This is because there are very few such 30% AMI units on the island now (nor are many are likely to be built in the future).

Further, it is likely that there will be more housing production in the higher AMIs, 60% and higher, and that some will be located in more superior areas – like Kakaako - thus, those capture rates decline.
Given that, we favor building to the level of potential demand, going forward.

Next, we use this model to project what the rental housing demand will look like in 5 years.

TABLE THIRTY-EIGHT: 2023 RENTER DEMAND, USING HHFDC 2018 RENTS & AMI DEFINITIONS

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	2,865	1,539	832	1,298
One Bed	1,739	1,932	1,175	1,939
Two Bed	1,416	1,363	665	1,469
Three Bed	2,008	2,379	1,192	1,559
Four Bed	1,057	1,370	1,459	1,625
Total	9,085	8,583	5,322	7,890
Market Capture %	95%	50%	33%	10%
Potential Demand	8,631	4,291	1,756	789

Proprietary using Ribbon Demographics Data

Next, we do the same for the Senior Demand, and then the Student Demand.

TABLE THIRTY-NINE: CURRENT YEAR SENIOR RENTER DEMAND, USING HHFDC 2018 RENTS & AMI

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	1,550	491	199	278
One Bed	655	419	276	399
Two Bed	374	320	176	236
Three Bed	203	214	110	107
Four Bed	159	135	57	89
Total	2,941	1,579	818	1,108
Market Capture %	95%	50%	33%	10%
Potential Demand	2,794	790	270	111

Proprietary using Ribbon Demographics Data

Next, we use this model to project what the rental housing demand will look like in 5 years.

TABLE FORTY: 2023 SENIOR RENTER DEMAND, USING HHFDC 2018 RENTS & AMI

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	1,844	584	283	365
One Bed	658	408	291	415
Two Bed	223	214	127	194
Three Bed	278	290	169	189
Four Bed	147	141	69	124
Total	3,150	1,638	939	1,287
Market Capture %	95%	50%	33%	10%
Potential Demand	2,992	819	310	129

Proprietary using Ribbon Demographics Data

TABLE FORTY-ONE: CURRENT YEAR STUDENT AGE RENTER DEMAND, PER AMI

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	216	177	53	81
One Bed	336	327	137	227
Two Bed	338	217	88	182
Three Bed	389	354	140	108
Four Bed	153	196	222	196
Total	1,433	1,271	639	794
Market Capture %	95%	50%	33%	10%
Potential Demand	1,361	636	211	79

Proprietary using Ribbon Demographics Data

Next, we use this model to project what the rental housing demand will look like in 5 years.

TABLE FORTY-TWO: 2023 SENIOR STUDENT DEMAND, USING HHFDC 2018 RENTS & AMI

	30% AMI	50% AMI	60% AMI	80% AMI
Studios	224	230	47	98
One Bed	338	415	106	175
Two Bed	313	162	55	114
Three Bed	327	312	108	118
Four Bed	170	103	46	51
Total	1,371	1,223	315	556
Market Capture %	95%	50%	33%	10%
Potential Demand	1,302	611	104	56

Proprietary using Ribbon Demographics Data

XII. TARGET MARKET RENTAL UNIT ABSORPTION PROJECTIONS

The following is a projection into the future for deliveries of affordable rental housing units. It is done by project and/or developer. The basis of it is a combination of discussions with the developers and landowners in this market segment, of projections made by Department of Planning at the city, and of judgement of the author.

There are two starting points: the potential demand for affordable rental units, and the potential supply of the same.

The economics of developing (supplying) affordable rental housing require there be a subsidy from the public sector, to cover the all-in cost of production. This subsidy is one that increases significantly when producing housing at the lower (and lowest) AMI households.

In general, there is very little subsidy money available when producing rental housing for households making 60% or less of AMI. This constraint means that the deepest demand, households making 30% of AMI and under, will not be met by adequate supply. Indeed, history shows that the production for this AMI is less than 100 units a year across the state.

The next highest AMI, in terms of need, is the 50% is also similarly constrained.

The next highest, 60% of AMI level, does not need to be so highly subsidized. Thus, there potentially is an opportunity to produce rental housing for that segment. However, this usually is conditioned on the following:

- That the land beneath the project has zero cost, and
- That there are other subsides available, such as tax rebates and exemptions.

The same can be said, but to a lesser degree, for the 80% of AMI.

Given that, the table below makes a projection for 2023 for the demand and the supply of rental units targeted on the different AMI household segments. Note that the deepest pockets of demand are the lowest income ones. Also, per the table below, the lowest number of units supplied, or produced, are in those same low AMIs.

TABLE FORTY-THREE: 2023 RENTER DEMAND, USING HHFDC 2018 RENTS & AMI DEFINITIONS

	30% AMI	50% AMI	60% AMI	80% AMI
Potential Demand	8,631	4,291	1,756	789
Potential Supply/Yr.	35	25	15	200
Years Until Demand Meet	246.6	171.6	117.1	3.9

The production level in the table was set on a per year basis. It used historical data, current experience and future expectations to determine what could be produced, given past production.

It reflects the basic fact that the production of affordable rental units using federal tax credits, LIHTC, statewide allows for about 200 units a year to be funded. This means there is a ceiling statewide of 200 units per annum on production that is appropriate to the 30%, 50% and 60% AMI demand.

In the projection above, the potential supply (constrained by the 200-unit p.a. ceiling) shows some 75 units produced annually in the Kapolei target market. This is a 37.5% share of the statewide LIHTC production for the affordable market. Further, it is about half of what should be available for affordable unit development on Oahu per annum, over the long run (which adds to 70%, and that is a little more than the level of statewide population residing on Oahu).

The last line in the table takes the potential demand by the projected supply and shows the number of years there would be until supply meets demand. Clearly, this is a long time for the lowest AMI segments.

The projections going forward uses the assumptions made in the table above, mainly that there will be a total of 275 affordable rental units produced per annum to serve demand in the 30% to 80% AMI market segments, in the following ratios (derived from the table above): 12.7% serving the 30% AMI; 9.1% serving 50%; 5.5% serving 60% and 72.7% serving the 80% of AMI target market segment.

And it assumes that the current conditions, meaning the subsidy menu of credits and exemptions will continue. That said, it is possible, indeed probable, that there will be policy changes that impact the supply of this housing. And while our hope and expectation is that they will be positive ones, it must be recognized that these changes weigh on the public budget and cost the taxpayer… so the jury is out, as to the verdict here.

As seen, it identifies the major known players with land to be developed in the area. It includes University of Hawaii West and Kalaeloa. The largest single player in the market is DR Horton with 1,175 units in the 80% and below AMI, per their affordable obligation. It is assumed they will do 45 units/year, which matches their projected annual rate of 450 total units sold a year. The other major player should be Hunt Development at Kalaeloa, but their land is out of the way and not as appealing as other lands. However, given the possibility of Mayor Wright being even more delayed than it already is, the company could put more effort into developing this site.

The other two major players fall within the public sector, specifically the state of Hawaii, and we are uncertain to some extent as to their will to develop, and to a lessor extent, their capacity.

Finally, the table identifies the projection of development on the lands that are the subject of this study, the DLNR East Kapolei TOD related lands. It assumes that these lands will produce a quantity of affordable rental units that will allow supply to meet demand, as defined above.

TABLE FORTY-FOUR: AFFORDABLE RENTAL SUPPLY PIPELINE

	East Kapolei HHFDC	Hoopili Horton	Others (UHW, Kalaeloa)	East Kapolei DLNR/TOD	TOTAL UNITS
2020	110		35		**145**
2021		90	35		**125**
2022	110		35		**145**
2023		90	35	150	**275**
2024	100		35	150	**285**
2025		90	35	150	**275**
2026	100		35	150	**285**
2027		90	35	150	**275**
2028	100		35	150	**285**
2029		90	35	150	**275**
2030	90		35	150	**275**
2031		90	35	150	**275**
2032			35	230	**265**
2033		90	35	150	**275**
2034			35	230	**265**
2035		90	35	150	**275**
TOTALS	610	720	560	2,110	**4,000**

As seen, it assumes that the subject parcel will be more active and productive than the parcels around it. This is because of our assumption that DLNR, the landowner will be more proactive than the other landowners in terms of being supportive of affordable housing. This is a subjective assumption, based on the observation that this (and every public agency has the ability to act in a way that serves a public need, even if it comes at a cost (a cost that the private sector is unable or unwilling to bear).

Simply put, it means the landowner, the state, will be offering builders and affordable housing developers a better value package (especially a very low cost of leasing the land).

XIII. CONCLUSIONS

Early on in the study, we tried to determine with some certainty the maximum number of housing units the zoning regulations would allow development on this land. The number posited was around 2,000 units, if the land plan and governing regulations allowed the buildings on the land to attain a maximum building height, given the TOD regime.

We then tried to determine the maximum number of rental units, given that the fee would not available to those living in these dwelling – meaning these units would not be owned by the individual households occupying them.

Our analysis then showed there was deep potential demand in the household segments making 30%, 50% and 60% of AMI, much deeper than 2,000 units.

So, on the demand side, in light of strong need for housing by those families and households, we can conclude that the development of this property could hold more units.

However, on the supply side, the actual financing and construction cost realities present a high barrier to achieving such a high unit count. Indeed, these costs reduce the overall number of units that can be profitably produced.

Thus, those units targeting the higher AMI market have a reasonable chance of producing a return that's acceptable to a private developer - but not the lower ones. These lower AMI units need greater subsidy, to offset the costs. And the subsidies currently available do not appear sufficient to fund large-scale production of units serving the lower AMI households.

Thus, it needs be said that while this demand is high, high costs prevent a commensurate amount of supply… without further subsidy. Indeed, the program we have posited above is relatively aggressive.

In light of the fact that the owner of this parcel is a public agency, we cannot help but ask whether it is possible that a political decision to increase the subsidy. The premise for this is that there is a genuine and significant social benefit created by supplying shelter to this segment of the community. If so, this could allow the development of this site to be done at a lower cost. To that end, costs could be lowered in at least two ways:

- by reducing the price of the land or
- by reducing or eliminating other costs normally needed to be paid by the developer, park and school fees, etc.

Under those assumptions, we are comfortable with making projecting that this land could accommodate a number of dwelling higher than zoning and regulations allow.

Appendix C

Hotel Market Assessment and Development Outlook

Hotel Market Assessment and Development Outlook
East Kapolei, Oahu, Hawai‘i

February 14, 2019

Prepared for Colliers International
by
Erik Kloninger Consulting

I. EXECUTIVE SUMMARY

Erik Kloninger Consulting LLC was retained by Colliers International to analyze potential hotel use at certain sites located in East Kapolei, Oahu, Hawai'i. The sites, owned by the State of Hawai'i Department of Land & Natural Resources, are located proximate to the University of Hawai'i, West Oahu campus and a future station of the Honolulu Area Rapid Transit ("Rail"). Our findings are summarized below:

- Oahu has one of the strongest hotel markets in the U.S. Among the top-25 lodging markets, Oahu achieved the second highest occupancy, third highest average daily rate ("ADR") second highest room revenue per available room ("RevPAR").

- While Waikiki continues to have a dominant share of Oahu's hotel rooms, capacity constraints in Waikiki have limited the growth of new hotel supply. As a result, new hotel development has taken place outside of Waikiki, most recently in the Kapolei sub-market.

- The leisure segment represents about 70% of hotel room demand on Oahu. Visiting friends and family, government/military and corporate demand and the meeting market each represent about 6% of hotel room demand on Oahu.

- Two limited-service hotels (primarily rooms-only operations with limited food and beverage service) opened in Kapolei in recent years. The Hampton Inn & Suites Kapolei ("Hampton Inn") and Embassy Suites Kapolei ("Embassy Suites") opened in 2016 and 2017, respectively. Both hotels are reportedly performing well, achieving occupancies and ADRs comparable to the Oahu market. The Kapolei hotels serve a mix of government/military, corporate and leisure segments. A third Kapolei hotel, the Residence Inn Kapolei, ("Residence Inn") is under construction and scheduled to open in September.

- Prior to the opening of the two Kapolei hotels, the hotel inventory in the area was concentrated in the nearby Ko Olina Resort. The Ko Olina hotels are beachfront resort hotels with multiple dining options, amenities and services. Room rates in the resort generally exceed $500 per night.

- In addition to the soon-to-open Residence Inn, further hotel development in the area is expected. The developer of the Embassy Suites and Residence Inn has purchased a development site near its two hotels. It is expected that the developer will build the fourth area hotel in the next five years. Future hotels can be built on any of a host of potential development sites in the area in coming years, as market conditions warrant.

- The growth of lodging demand in the area will ultimately dictate how many of the potential sites see hotel development in the future. Considerations such as proximity to demand generators, character of surrounding area, access, visibility and brand will in part determine which hotels are ultimately built. With respect to the DLNR sites, the future Rail station offers the greatest potential for hotel development, due to its proximity to a Rail station and likely commercial development proximate to the station.

- The development site most directly competitive with the DLNR site is the future mixed-use development component of UH West Oahu.

II. OAHU & WEST OAHU HOTEL ROOM SUPPLY

Oahu has approximately 39,000 visitor rooms, according the Hawai‘i Tourism Authority (“ HTA”) Visitor Plant Inventory. The supply of visitor rooms on the island increased by 9.0% from 2014 to 2018, with most of the growth driven by an increase in the number of Vacation Rental Units. Hotel rooms remain the dominant accommodation type on Oahu, representing about 70% of the total room count.

Oahu Room Supply by Type					
	2014	**2015**	**2016**	**2017**	**2018P**
Apt/Hotel	235	55	48	50	50
B&B	53	48	43	47	47
Condo Hotel	4,010	4,328	4,379	4,246	4,242
Hostel	231	235	235	239	267
Hotel	26,665	25,684	26,152	27,102	27,306
Vacation Rental Unit	810	2,316	3,125	3,270	3,221
Timeshare	3,669	3,151	3,193	3,329	3,731
Other	191	241	225	225	225
Total	**35,864**	**36,058**	**37,400**	**38,508**	**39,089**

Source: Hawaii Tourism Authority

The majority of Oahu’s visitor rooms are located in Waikiki, home to about 31,000 of the island’s 39,000 rooms in 2018. Between 2014 and 2018 Waikiki’s room supply increased by 6.9%, slower than the overall growth for the island. Hotel rooms comprise the vast majority of Waikiki’s visitor rooms, although the number of Vacation Rental Units increased dramatically during the period.

Waikiki Area Room Supply by Type					
	2014	**2015**	**2016**	**2017**	**2018P**
Apt/Hotel	198	18	18	18	18
B&B	5	7	7	7	7
Condo Hotel	3,372	2,862	2,896	2,883	2,879
Hostel	169	169	169	169	197
Hotel	22,327	22,360	22,828	23,697	23,349
Vacation Rental Unit	505	1,824	2,301	2,117	2,068
Timeshare	2,238	1,720	1,762	1,898	2,300
Other	19	16	0	0	0
Total	**28,833**	**28,976**	**29,981**	**30,789**	**30,818**

Source: Hawaii Tourism Authority

West Oahu, which includes the Kapolei sub-market, Ko Olina Resort and the Waianae Coast, has 3,270 visitor rooms, or 8.2% of Oahu's total room count. The supply of rooms increased by 20.2% since 2014, driven by growth in hotel supply and Vacation Rentals. The two newest hotels on the island are located in the area, the 175-room Hampton Inn (2016) and the 180-room Embassy Suites (2017).

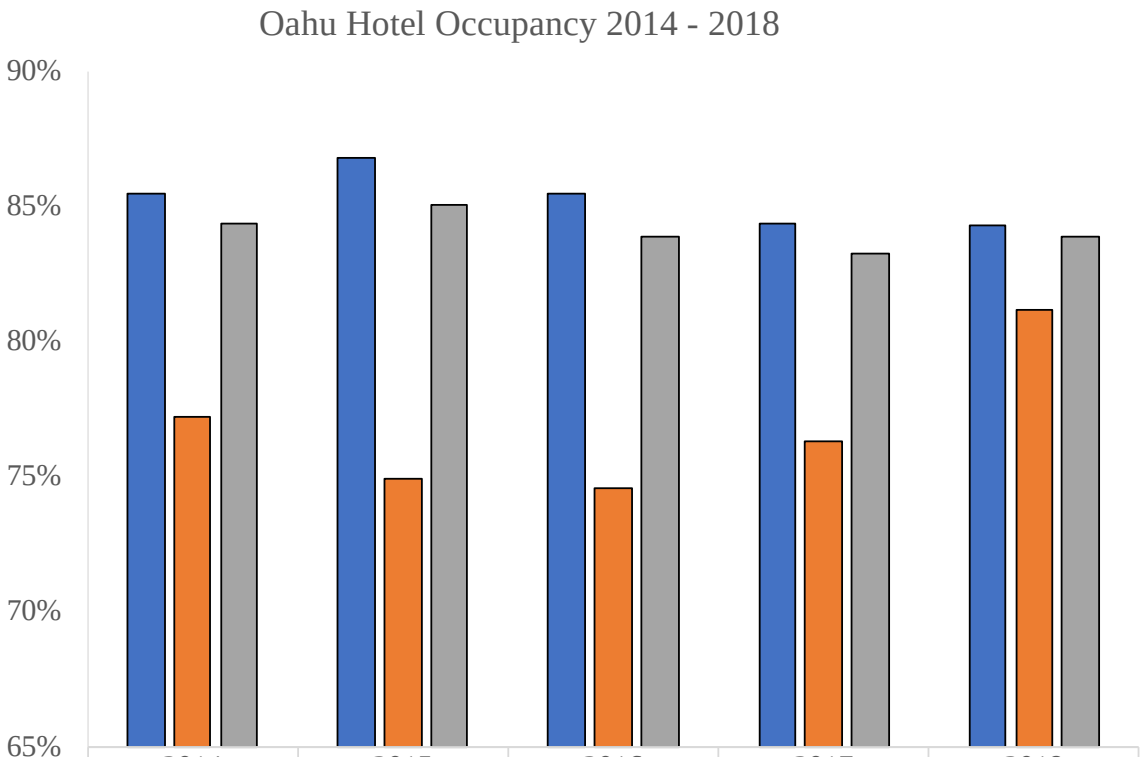
West Oahu Room Supply by Type					
	2014	**2015**	**2016**	**2017**	**2018P**
Apt/Hotel	0	30	30	30	30
B&B	0	2	2	2	2
Condo Hotel	487	206	206	206	206
Hotel	746	359	359	905	1,085
Vacation Rental Unit	17	39	312	473	473
Timeshare	1,431	1,431	43	43	1,431
Other	39	43	1,431	1,431	43
Total	**2,720**	**2,110**	**2,383**	**3,090**	**3,270**

Source: Hawaii Tourism Authority

III. OAHU HOTEL MARKET PERFORMANCE

Oahu's hotel market is considered one of the strongest markets in the U.S., driven by the strength of the Waikiki market. Due to capacity constraints in Waikiki, the excess demand has driven performance in the sub-markets outside of Waikiki in recent years.

Oahu's hotel occupancy has ranged between 83% and 85% in recent years, driven by Waikiki's consistently high occupancy. In 2018, Oahu's occupancy averaged 83.9%, which was the second highest major market occupancy in the U.S., trailing only New York City's 87.3%. Traditionally, hotels located outside of Waikiki tended to achieve lower occupancy rates than Waikiki hotels. In 2018 the gap narrowed, with the Other Oahu segment achieving 81.2% occupancy, in increase from the mid to upper 70% range achieved in the previous four years.

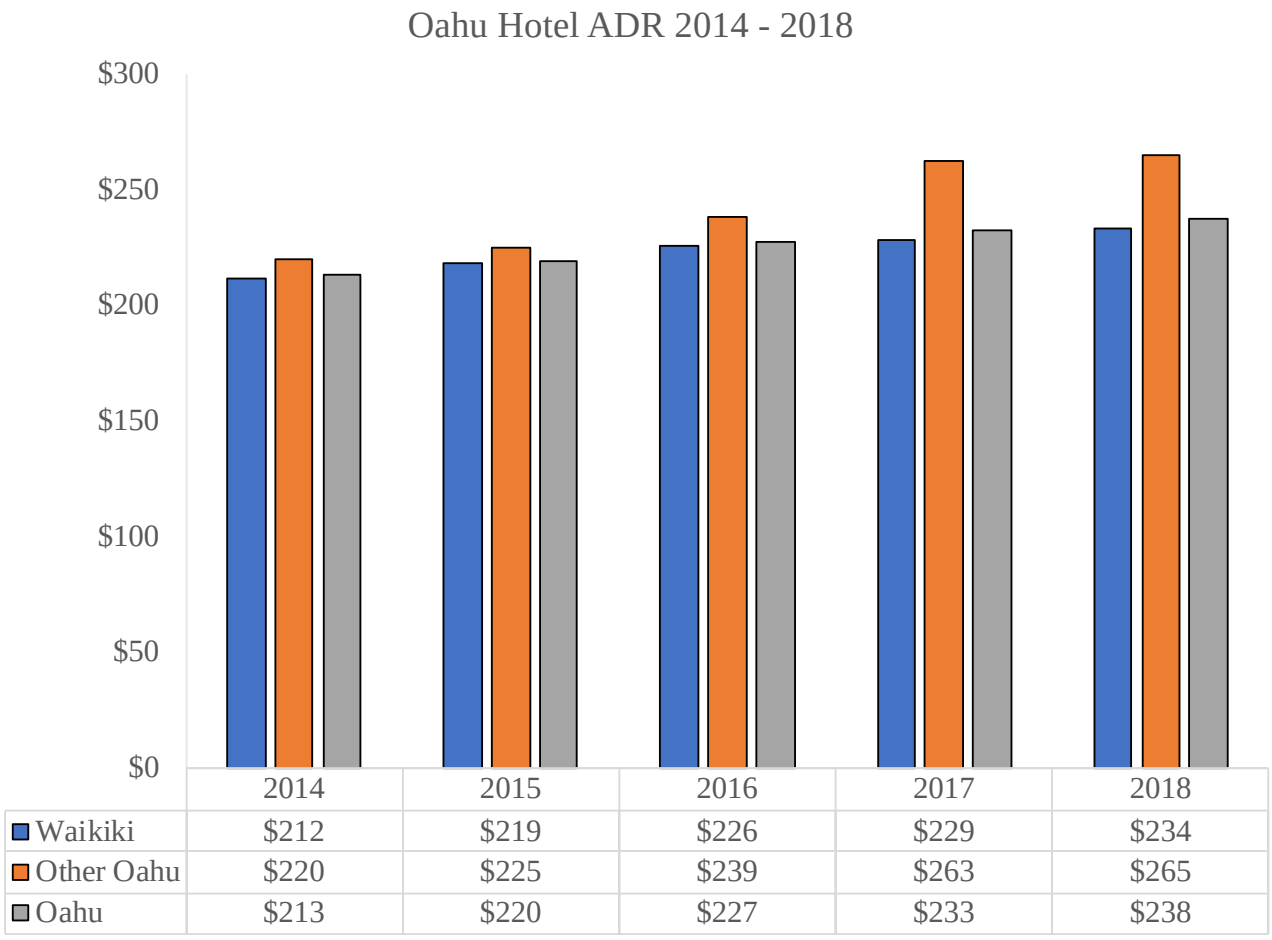


	2014	2015	2016	2017	2018
Waikiki	85.5%	86.8%	85.5%	84.4%	84.3%
Other Oahu	77.2%	74.9%	74.6%	76.3%	81.2%
Oahu	84.4%	85.1%	83.9%	83.3%	83.9%

Source: STR data reported by Hawai'i Tourism Authority

Oahu's ADR was $238 in 2018 and has increased by modest amounts between 2014 and 2018. During 2018, Oahu achieved the third highest ADR among the top-25 U.S. markets, trailing only New York City ($262) and San Francisco ($241). According to STR data reported by HTA, Oahu hotels generated about $2.2 billion in room revenue in 2018, a 2.9% increase over 2017.

The Other Oahu segment has achieved higher ADRs than Waikiki, driven primarily by a few luxury hotels located outside of Waikiki. In 2018, ADR for Other Oahu averaged $265, a substantial premium over the rates achieved in Waikiki and larger than the premiums achieved during 2014 to 2016. Some of this is likely due in part to the Four Seasons Oahu, which opened in 2017 following a renovation and conversion from the JW brand.

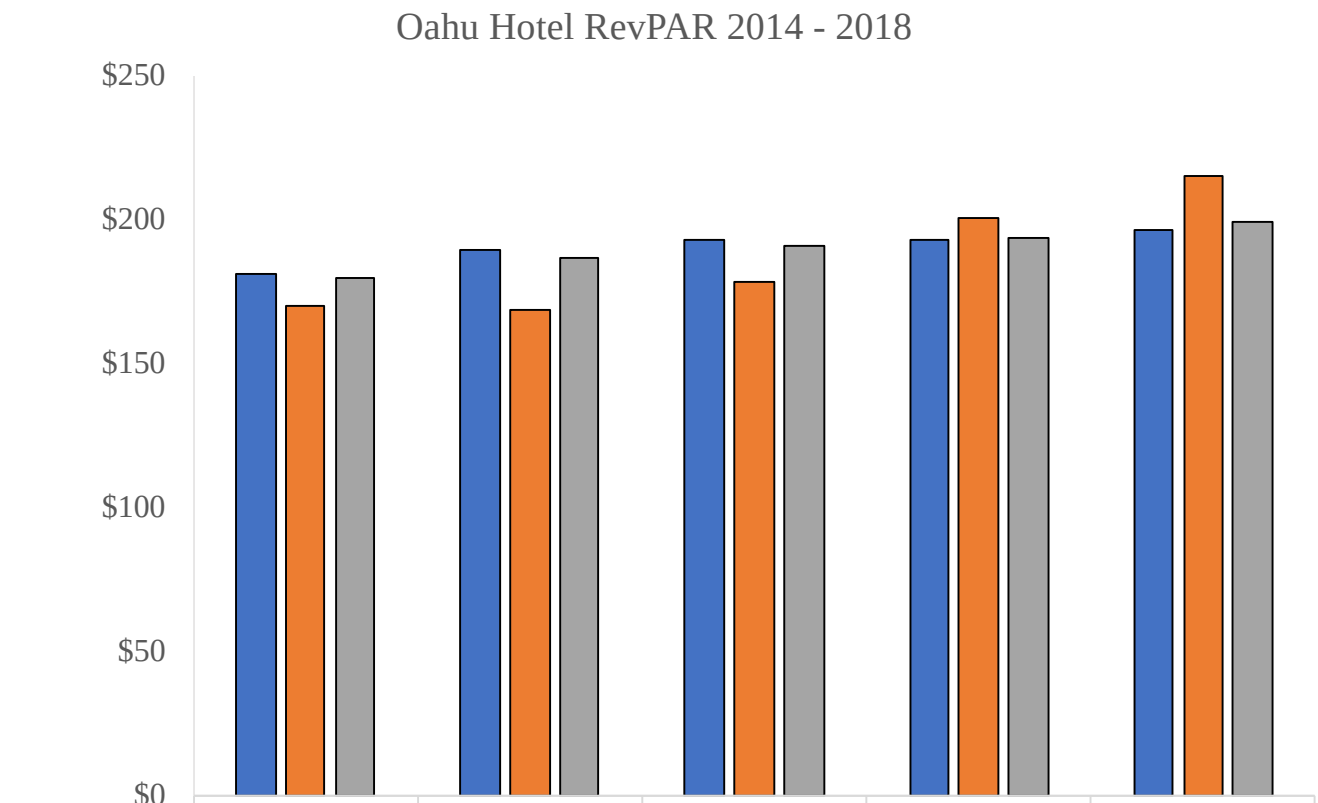


	2014	2015	2016	2017	2018
Waikiki	$212	$219	$226	$229	$234
Other Oahu	$220	$225	$239	$263	$265
Oahu	$213	$220	$227	$233	$238

Source: STR data reported by Hawai'i Tourism Authority

Oahu hotels generated RevPAR of $200 in 2018. Oahu's 2018 RevPAR ranked second among the major U.S. lodging markets, trailing only New York City's $229 RevPAR for the year.

Historically, the Other Oahu segment achieved lower RevPAR than Waikiki, mainly due to lower occupancy. In 2017, Other Oahu RevPAR of $201 exceeded Waikiki's $193. The gap increased to $18 in 2018, driven by improved occupancy and ADR of the Other Oahu segment.



	2014	2015	2016	2017	2018
Waikiki	$181	$190	$193	$193	$197
Other Oahu	$170	$169	$178	$201	$215
Oahu	$180	$187	$191	$194	$200

Source: STR data reported by Hawai'i Tourism Authority

IV. OAHU HOTEL DEMAND BY PURPOSE OF VISIT

About 3.1 million visitors to Oahu in 2018 indicated they intended to stay in a hotel while on the island, according to HTA data. Total nightly hotel demand on Oahu is about 26,500 rooms on an annual basis. The leisure market accounts for 70.2% of nightly Oahu hotel room demand. Of the non-leisure demand, the corporate market accounts for 6.1% of demand, or 1,631 occupied rooms each night, followed closely by the meeting, convention & incentive ("MCI") market, visit friends or relatives ("VFR") at 5.7% of demand and military & government demand also accounting for 5.7% of hotel room demand. (It should be noted that this analysis does not include demand for accommodations generated by Oahu residents or visiting residents of the Neighbor Islands.)

Oahu Hotel Demand by Purpose of Visit
2018

	Leisure	Visit Friends or Relatives	Meeting, Convention & Incentive	Corporate	Attend a Sporting Event	Military & Government	Attend School	Other	Total
Visitors to Oahu	2,364,836	100,751	203,524	103,415	24,761	66,481	7,957	210,527	3,082,252
Average Length of Stay on Oahu (Nights)	6.4	9.1	5.1	7.6	6.6	10.1	18.3	5.5	
Visitor Nights on Oahu	15,134,952	915,825	1,046,112	780,784	163,669	672,120	145,927	1,153,690	20,013,080
Average Party Size	2.4	1.8	2.0	1.4	2.0	1.3	2.3	2.6	
Hotel Room Demand On Oahu	6,202,849	500,451	512,800	542,211	80,230	501,582	62,630	437,004	8,839,757
Nightly Hotel Room Night Demand on Oahu	18,571	1,498	1,535	1,623	240	1,502	188	1,308	26,466
Percent of Total	*70.2%*	*5.7%*	*5.8%*	*6.1%*	*0.9%*	*5.7%*	*0.7%*	*4.9%*	*100.0%*

Sources: Hawai'i Tourism Authority, Erik Kloninger Consulting

In assessing market demand for proposed new hotels on Oahu, one should consider the proposed new hotel's ability to capture demand from a variety of demand segments. The Project sites' close proximity to UH West Oahu and Tokai University position it to capture a share of the niche market for people attending school in Hawai'i. Proximity to the Central Oahu Regional Park and Waipio Soccer Complex, and Aloha Stadium (via Rail) position a hotel in the area for capturing a share of that market as well.

The area also has corporate demand generators, Campbell Industrial Park and Ko Olina Resort. Ko Olina is expected to generate demand over the next ten years as new mega resort hotels are built on the remaining beachfront parcels. Kalaeloa Airport is a significant area demand generator in the military & government sector, primarily due to demand generated by Coast Guard personnel training at the airport. The VFR market is driven by area population, so that as more homes are built in the area, demand for visiting friends and family can be expected to continue to increase.

Lastly, the ability to capture some of the island's leisure demand is a critical to the success of any hotel on Oahu. Our market interviews indicate that the existing hotels in Kapolei are capturing leisure demand, in part due to the lower room rates available compared to Ko Olina's beachfront resort hotels.

V. PROFILE OF WEST OAHU HOTEL SUPPLY

Between 1994 and 2011, four beachfront resort properties were built in Ko Olina Resort, a master-planned fully-amenitized resort located about four miles west of the DLNR sites. A sampling of rates offered on Expedia shows that the hotels in the resort have room rates in the $500 to $600 range per night. The Marriott Ko Olina Beach Club, a timeshare resort offers lower rates, in the $300s, on its unused timeshare inventory.

Recently, new hotel development in the area has consisted of new-build limited-service hotels. The 175-room Hampton Inn opened at the Ka Makana Alii Mall in 2016, followed by the180-room Embassy Suites in 2018. Changes to Honolulu's Land Use Ordinance has made limited-service hotels with up to 180 rooms possible on BMX-3 zoned land. Previously, hotel development was generally only allowed in designated resort areas such as Waikiki and Ko Olina, Downtown Honolulu and the area around Honolulu International Airport. As shown in the table below, the room rates offered at the new limited-service hotels in Kapolei are substantially lower than the rates available at the Ko Olina hotels. The rates offered for the two properties are lower than the 2018 Oahu ADR of $238.

West Oahu Property Profile

Property	Rooms	Year Open	Type	Published Rates Feb-19	Published Rates Apr-19
Four Seasons Resort Ko Olina	371	1994	Luxury Hotel	$620	$570
Marriott Ko Olina Beach Club (1)	918	2003	Timeshare	$321	$356
Ko Olina Beach Villas	164	2008	Luxury Condo-Hotel	$606	$500
Aulani, A Disney Resort & Spa	359	2011	Resort Hotel	$539	$509
Hampton Inn & Suites Kapolei	175	2016	Limited-Service Hotel	$212	$246
Embassy Suites by Hilton Kapolei	180	2017	Limited-Service Hotel	$212	$166

Note: (1) Timeshare property that offers unused inventory for transient rental.

Source: Hawaii Tourism Authority, Erik Kloninger Consulting, Expedia

Based on our market interviews, the two existing Kapolei hotels have been achieving occupancies comparable to the Oahu average of 84%, at average rates of about $220 per night. Both hotels have been getting some government/military business, primarily generated by Coast Guard personnel training at nearby Kalaeloa Airport. The Federal lodging per diem for Oahu is $177 per night, making this segment less attractive than other higher-paying markets. Corporate demand is generated by businesses located in Campbell Industrial Park and Ko Olina. Two of Ko Olina's prime beachfront parcels have been sold to a developer, China Oceanwide, which has announced plans to develop an Atlantis mega-resort property on one of the sites. Construction of future properties such as Atlantis can be expected to generate demand for accommodations in the area, from visiting professionals, contractors and suppliers.

The two Kapolei hotels also capture demand generated by the *kama'aina,* VFR, sports and leisure markets. As can be seen on the area map below, the DLNR sites are well-positioned for demand generated by UH West Oahu and Hoopili but are somewhat removed from the major area demand generators.

West Oahu Hotels and Demand Generators

VI. **PLANNED COMPETITIVE SUPPLY**

A third limited-service hotel is under construction in Kapolei, near the Embassy Suites in the 40-acre Leihano mixed-use community near downtown Kapolei. The 180-room Residence Inn Kapolei is scheduled to open in September. This hotel is being developed by Garn Development, which also developed and owns the Embassy Suites Kapolei. Garn has bought a third development site near their first two sites in Leihano. No opening date or brand has been announced for the third Leihano hotel in Kapolei.

VII. FUTURE COMPETITIVE SUPPLY

There are multiple potential sites for developing limited-service hotels in the Kapolei area, in part due to the high prevalence of BMX-3 zoning. Of the DLNR sites in East Kapolei, the site of the future Rail Park and Ride ("the DLNR site") presents the most compelling opportunity for hotel development due to proximity to UH West Oahu and Rail station #2. Other future potential hotel sites that would be competitive with the DLNR site include:

UH West Oahu Village: As UH West Oahu builds out and adds academic programs and enrollment, it will generate increasing demand for accommodations in the area. A hotel at either the DLNR site or in the UH West Oahu Village will be well-positioned to capture a substantial share of this demand. Whether the market can support hotels built on both sites is uncertain.

Ho'opili: The nearby master-planned community of Ho'opili will have BMX-3 zoned land suitable for hotel development. While the developer of Ho'opili is focused on the residential market, it could sell commercial land to a hotel developer.

Ka Makana Ali'i: Home to the Hampton Inn Kapolei, this regional shopping center has announced plans to add a second hotel during a later development phase. No timing has been announced. The challenging climate for shopping centers may dictate if and when Ka Makana Ali'i expands in the future.

Hunt Kalaeloa: Hunt has plans to re-develop part of the site of the former Naval Air Station Barbers Point with a mix of residential and commercial uses. Plans include a future hotel development site but no timetable has been announced. Proximity to demand generators such as Kalaeloa Airport and Campbell Industrial Park and to White Plains Beach make Hunt Kalaeloa a compelling site for hotel development.

Other Kapolei: There are other potential hotel development sites around Kapolei. None have been announced as future hotel sites.

Hoakalei: Primarily a residential development, Hoakalei has resort zoning for up to 950 hotel rooms. The developer has looked at hotel, timeshare and condominium hotel as potential future uses fronting the resort's signature lagoon.

Ko Olina: Future development of the off-beach parcels in Ko Olina Resort could include hotels considered competitive with a hotel on the DLNR site. At this time there have been no announcements of any competitive projects at the resort, as the focus has been on building out the prime beachfront parcels. Future development of beachfront mega-resorts will generate demand for accommodations in the area during construction. The Atlantis Ko Olina, with 800 hotel rooms and 524 condo hotel units, is early in the permitting process according to published reports. China Oceanwide, which is developing the Atlantis, bought a second beachfront resort lot at Ko Olina but no project has been announced.

Other TOD: It is likely that there will be future development of hotels in the Transit Oriented Development ("TOD") areas around the Rail stations. Such hotels at nearby stations would be considered competitive to a hotel built at the DLNR site.

VIII. ESTIMATED SUPPLY & DEMAND FOR KAPOLEI HOTEL ROOMS

Estimated Supply and Demand to 2030

As shown in the table below, there are 355 hotel rooms in Kapolei, the Hampton Inn and the Embassy Suites. The supply will increase to 415 rooms later this year when the Residence Inn opens. We have added the third Leihano hotel to the supply in 2024, based on our analysis of the market.

Estimated Kapolei Hotel Room Supply

Year	Room Supply	Notes
2018	355	Hampton Inn & Embassy Suites
2019	415	Residence Inn opens September
2020	535	
2021	535	
2022	535	
2023	535	
2024	760	Third Leihano hotel opens
2025	760	
2026	760	
2027	760	
2028	760	
2029	760	
2030	760	

Source: Erik Kloninger Consulting

The table below presents our estimate of Kapolei supply, demand and occupancy through 2030. Our baseline 2018 occupancy was based on available data and market interviews. Based on available State and County forecasts of population and economic activity in the Kapolei area, we have applied 6% growth rate to market demand through 2025. Thereafter we have estimated demand growing by 5% per year. The market occupancy is estimated to decrease to 63% in 2020, following the opening of the Residence Inn in late 2019. Estimated occupancy increases to 75% by 2023 as the market absorbs the new supply, before dipping again following the projected opening of the third Leihano hotel. Our analysis indicates that market conditions could become favorable for additional new hotel development in Kapolei after 2030.

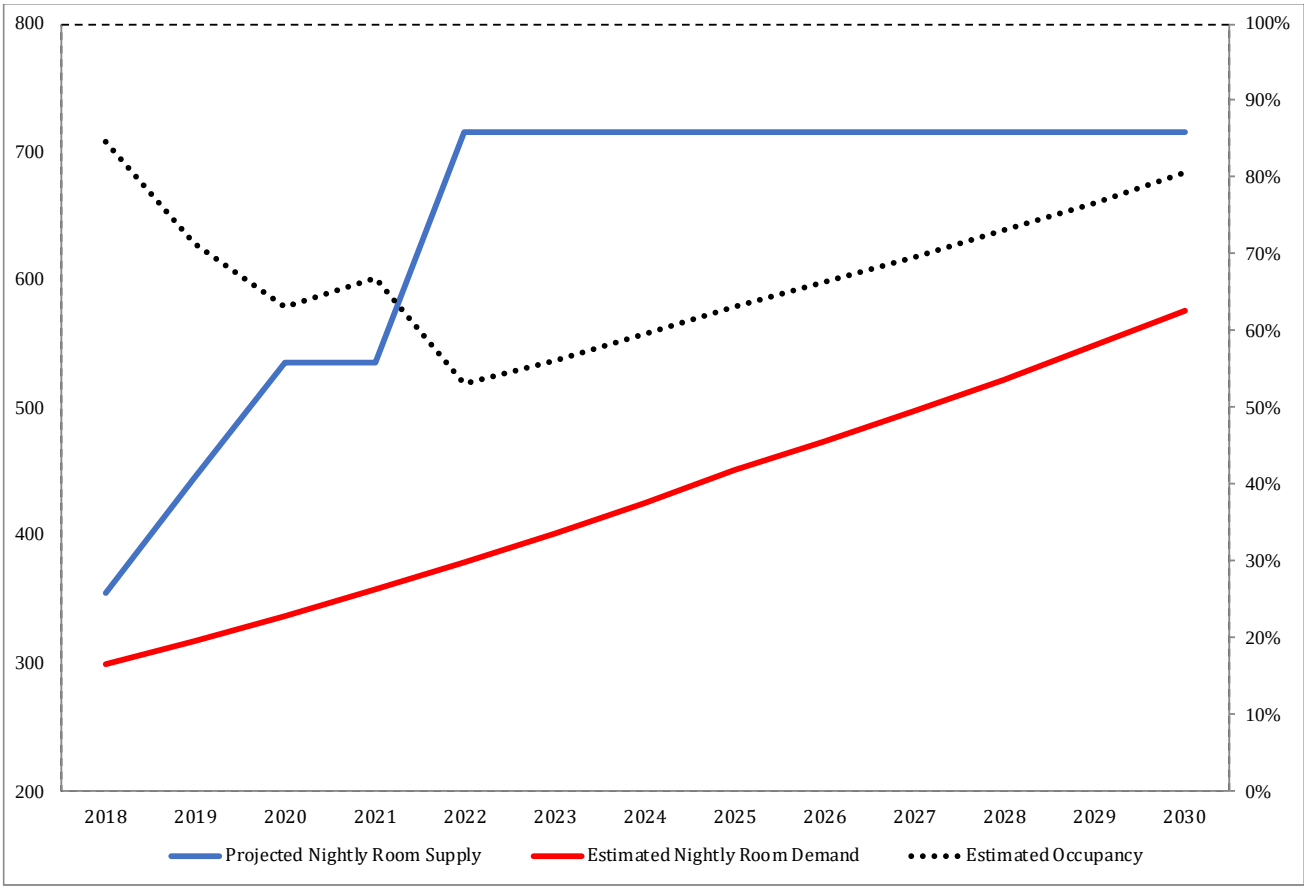
Estimated Kapolei Hotel Room Supply, Demand & Occupancy

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Projected Nightly Room Supply	355	415	535	535	535	535	760	760	760	760	760	760	760
Estimated Nightly Room Demand	300	318	337	357	379	401	426	451	474	497	522	548	576
Estimated Occupancy	85%	77%	63%	67%	71%	75%	56%	59%	62%	65%	69%	72%	76%

Source: Erik Kloninger Consulting

The chart below presents the estimated supply, demand and occupancy in Kapolei to the year 2030. Occupancy in the market (dotted line) starts at an estimated 85% but decreases as new supply is added to the market. Once the room supply stabilizes, occupancy increases as market demand catches up with supply.

Estimated Kapolei Hotel Room Supply, Demand & Occupancy



Estimated Supply and Demand 2031 to 2039

We have projected new 180-room hotels entering service in 2031 and 2036, based on new supply being added as market conditions warrant. It should be noted that these estimated dates for additional hotel supply are based on current growth forecasts. Any changes in market or economic conditions could either accelerate or decelerate the timetable for future development.

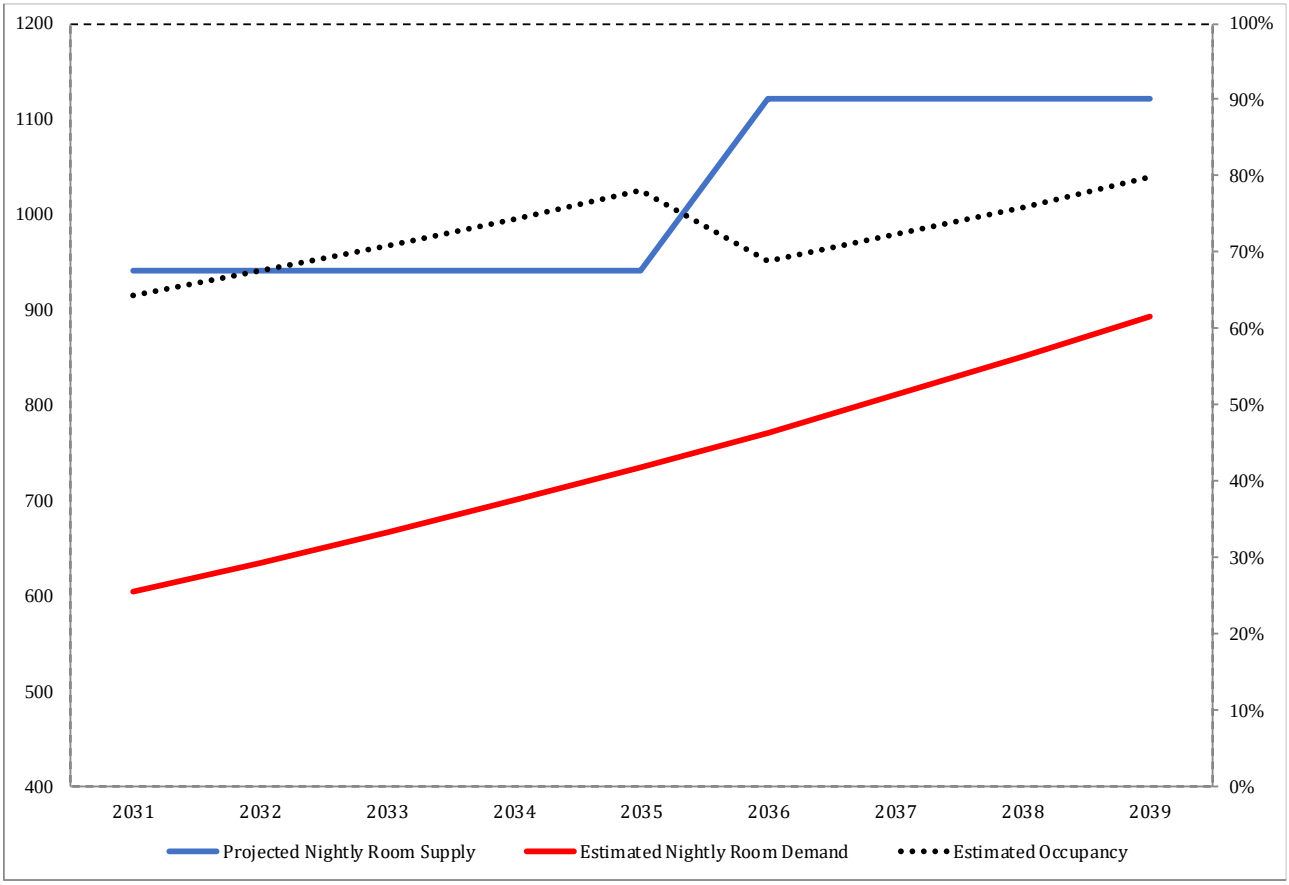
Estimated Kapolei Hotel Room Supply, Demand & Occupancy

	2031	2032	2033	2034	2035	2036	2037	2038	2039
Projected Nightly Room Supply	940	940	940	940	940	1120	1120	1120	1120
Estimated Nightly Room Demand	605	635	666	700	735	772	810	851	893
Estimated Occupancy	64%	68%	71%	74%	78%	69%	72%	76%	80%

Source: Erik Kloninger Consulting

The chart below graphically presents the supply, demand and occupancy in the Kapolei sub-market from 2031 to 2039.

Estimated Kapolei Hotel Room Supply, Demand & Occupancy



IX. SUCCESS FACTORS FOR NEW SUPPLY

In recent years, a new hotel sub-market has developed in Kapolei. To date, the two Kapolei hotels have reportedly performed well by catering to previously unaccommodated demand in the area. Kapolei continues to be attractive for developers because of the availability of development sites and anticipated future economic and population growth in the area. As new hotels are built, there will be increasing competition for existing government and commercial demand generated by Kalaeloa Airport and Campbell Industrial Park.

Some of the key success factors for future hotels, which will in part determine which sites are chosen for hotel development include:

- **Continued Economic Growth in Kapolei:** The expected future growth of military/government and business activity in the area will drive additional hotel development in the area. The build-out of the Ko Olina Resort will generate demand for accommodations in the Kapolei, as will any future growth in activity at the Kalaeloa Airport.

- **Relationship to Demand Generators:** A hotel built within walking distance of UH West Oahu, for example, will have a competitive advantage for capturing demand generated by the university. By the same token, hotels built close to downtown Kapolei will have an advantage over a UH West Oahu hotel in capturing demand generated by downtown Kapolei.

- **Character of Surrounding Area:** In a future Kapolei lodging market, the character of the area around a hotel site will also determine whether a hotel is developed or not. Hotel sites that are part of mixed-use developments that offer dining and entertainment options to guests will be more attractive than sites that are not located near such amenities.

- **Access:** Superior access to major area connector roads, H-1 or the Rail line will confer some advantage to some potential hotel development sites.

- **Brand:** Having a first-tier brand from one the industry leaders Marriott and Hilton, will provide a competitive advantage over independent properties or brands with less traction in the select-service market.

- **Build out of UH West Oahu:** The build-out of the campus and addition of new academic programs will be critical to the success of any new hotel development in the area.

- **Ability to Capture Leisure Demand:** Since Oahu's hotel demand is primarily leisure-driven, the acceptance of non-resort locations by leisure visitors will in part determine the pace of future hotel development in Kapolei. Based on market interviews, the two existing Kapolei hotels have been able to capture leisure demand. At this time the depth of the leisure market in Kapolei is uncertain.

X. COMMENTARY ON FINANCIAL FEASIBILITY

Our analysis of the Kapolei hotel market indicates that the known addition to supply (Residence Inn September 2019) and likely addition (third Leihano hotel projected to open in 2024) are the only new supply likely over the next five and ten years. Over a ten to 20-year period, expected growth in demand is projected to warrant the addition of two additional 180-room hotels in the market. It should be noted that if the Kapolei hotels continue to gain traction with the leisure market, however, additional hotel supply can be expected. By the same token, a slowdown in regional growth would likely push additional hotel development further into the future.

Based on our market interviews, we estimate that the current hotel market in Kapolei is achieving an 85% occupancy at a $210 ADR. For a 180-room limited service hotel this translates into total annual revenue of approximately $12 million. Applying historic industry ratios for limited-service hotels in Hawai‘i indicates estimated net operating income of $4.8 million.

According to published reports, construction costs of the recently built Kapolei hotels were about $60 million for 180 rooms, or about $330,000/room, not including the cost of land.

Appendix D

Infrastructure Study

Infrastructure Study

Strategic Master Development Plan for Department of Land and Natural Resources East Kapolei Lands

TMK 9-1-016: 008, 9-1-017: 097, 9-1-018: 008 & 014

Honouliuli, Ewa, Oahu, Hawaii

February 2020

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1. **Introduction**

The State of Hawaii Department of Land and Natural Resources (DLNR) is planning to develop four parcels (TMK: 9-1-016: 008, 9-1-017: 097, 9-1-018: 008 and 014) in East Kapolei on the west side on the island of Oahu, Hawaii (Figure 1). The DLNR parcels are generally bounded by D. R. Horton Hoopili to the east and southeast, University of Hawaii West Oahu (UHWO) to the southwest, open lands to the west, and the H-1 Freeway to the north. In addition to the DLNR developments, there are projects planned in East Kapolei that are under Department of Hawaiian Home Lands (DHHL) and UHWO jurisdictions. Private developments by D. R. Horton (Hoopili and Gateway Lot) also have on-going projects in East Kapolei. The developments numbers analyzed in this study are provided in Tables 1 and 2.

This infrastructure study summarizes the preliminary assessment of the existing regional utilities based on the available data at the time of this study and provides the recommended utility improvements that are required to support the DLNR developments. Three conceptual alternatives were developed for the DLNR parcels and are shown in Figures 2 to 4. In general, they are divided into three distinct areas:

- Kualakai West (TMK: 9-1-016: 008 and 9-1-018: 008)
- Kualakai East (TMK: 9-1-018: 014)
- Transit-Oriented Development (TOD) Mixed Use (TMK: 9-1-017: 097)

It should be noted that DLNR is currently negotiating with D. R. Horton for a land exchange (approximately 11 acres) between the Kualakai West (TMK: 9-1-08: 008) and TOD Mixed Use (TMK: 9-1-017: 097), shown as hatched in Figures 2 to 4, to create a larger park and ride and development parcels next to the transit station.

The DLNR parcels are included in the State Office of Planning (OP) East Kapolei (TOD) Master Plan. As such, a preliminary phasing schedule for the State TOD was developed for the East Kapolei State Lands and provided the basis for the phasing schedule for DLNR lands as shown in Figure 5 and summarized below.

- Phase 1 (Year 2020 to Year 2029)
  TOD Mixed Use (TMK: 9-1-017: 097)

- Phase 2 (Year 2030 to Year 2039)
  Kualakai East (TMK: 9-1-018: 014)
  Kualakai West (TMK: 9-1-018:008)

- Phase 3 (Year 2040+)
  Kualakai West (TMK: 9-1-016:008)

The City and County of Honolulu (City) design standards were referenced as follows:

- Sewer demand calculations are based on the criteria stated in the Wastewater System Design Standards, City Department of Environmental Services (ENV), July 2017.
- Water demand calculations are based on the criteria stated in the Honolulu Board of Water Supply (BWS) standards, dated 2002. The use of dual water systems in East Kapolei has been approved by the BWS and was used in this study.
- On-site drainage is based on the design recurrence interval is 10-year for drainage area of 100 acres or less using the rational method per the City's Storm Drainage Standards, dated August 2017.

Table 1 East Kapolei Existing Conditions

Developments	Existing Conditions[1,2]	
	Res. (unit)	Comm. (sf)
D. R. Horton Hoopili	177	48,931
DHHL Kanehili	359	123,833
DHHL Kauluokahai	308	80,000
UHWO Makai	-	247,280
DLNR	-	-
Ka Makana Alii	-	1,400,000
Hawaii Tokai International College	-	91,808

Notes:
[1]Existing conditions data were compiled and provided by PBR Hawaii on December 2019. The data was based on the available data from the developers at the time of this study.
[2]All existing developments will remain.

Table 2 East Kapolei Proposed Development Numbers

Developments	Proposed Development Numbers[1]																	
	Phase 1						Phase 2						Phase 3					
	Res. (unit)	Comm. (sf)	Park & Ride (ac)	Hotel (rooms)	Park (acres)	Industrial (sf)	Res. (unit)	Comm. (sf)	Exchanged Land[2] (ac)	Hotel (rooms)	Park (acres)	Industrial (sf)	Res. (unit)	Comm. (sf)	Exchanged Land[2] (ac)	Hotel (rooms)	Park (acres)	Industrial (sf)
D. R. Horton Hoopili	6,216	2,645,529	-	-	-	2,482,920	5,027	542,260	-	-	-	-	-	-	-	-	-	-
DHHL Kanehili	44	100,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DHHL Kauluokahai	1,700	155,684	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UHWO Makai	820	552,000	-	-	-	391,000	1640	1,104,000	-	-	-	-	1,640	1,104,000	-	-	-	-
DLNR	720	70,000	14.4	180	2.6	-	280	-	10.6	-	-	1,893,118	-	-	-	-	-	836,788
Ka Makana Alii[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hawaii Tokai International College[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
[1]Development numbers were compiled and provided by PBR Hawaii on December 2019 and are subject to change.
[2]No new developments are anticipated from Phases 1 to 3 at the time of this study.

2. Infrastructure Systems

A. Wastewater System

The initial wastewater system for East Kapolei was based on the Ewa Master Plan (cited from Reference 6) completed by Campbell Estate in 1986 for the City of Kapolei, Makakilo, Ko Olina and the State. The master plan extended into East Kapolei by the State and recently updated by DHHL and D. R. Horton for Hoopili. UHWO included wastewater demand for the mauka and makai campus in their 2006 Long Range Development Plan (LRDP), which was incorporated into the regional wastewater master plans. Based on these master plans, the entire area from Ko Olina to the Honouliuli Wastewater Treatment Plant (WWTP) is served by trunk sewers along the former Oahu Railroad & Land Company (OR&L) right-of-way (ROW). The system was sized based on anticipated demand per parcel. Any increase in density, which requires additional sewer capacity will require negotiations with adjacent landowners or potentially an upgrade to the existing trunk sewers.

East Kapolei is currently served by an existing trunk sewer along Kualakai Parkway (referred as "Kualakai Trunk Sewer" hereafter), with sizes ranging from 30" to 42", and was constructed by DHHL (Figure 6). The existing Kualakai Trunk Sewer does not extend to Farrington Highway, ending near the intersection of Kualakai Parkway and Keahumoa Parkway. Per the Wastewater Master Plan for East Kapolei (Reference 1), the Kualakai Trunk Sewer will be extended mauka (referred as "Kualakai Trunk Sewer Extension" hereafter) to accommodate future developments. An existing sewer system serving the UHWO Makai property, with pipe sizes ranging from 12" to 24", connects to the existing Kualakai Trunk Sewer near the intersection of Kualakai Parkway and Keahumoa Parkway.

The TOD Mixed Use parcel was included in the design of the Hoopili backbone sewer system, according to the Hoopili Sewage Master Plan (Reference 2). This was due to uncertainties of the Kualakai Trunk Sewer Extension at that time so DLNR and D. R. Horton negotiated to convey sewer flow from this parcel through the Hoopili backbone sewer system. To be consistent with the previous Sewage Master Plans, the sewer demand was calculated in terms of equivalent population which was converted to sewage demand using the City standard of 80-gallons per capita per day. Table 3 below shows the equivalent population in the Hoopili Sewage Master Plan and the proposed equivalent populations for the three alternatives. The Hoopili backbone sewer system connects to an existing 36" trunk sewer along Keahumoa Parkway and Mango Tree Road (referred as "Keahumoa Trunk Sewer" hereafter). The Keahumoa Trunk Sewer ultimately connects to the existing Kualakai Trunk Sewer at a location approximately 1,400 feet mauka of intersection of Kapolei Parkway and Kualakai Parkway. The Keahumoa Trunk Sewer serves the developments from TOD Mixed Use, D. R. Horton Hoopili, and DHHL Kauluokahai.

Currently there is no existing sewer system along Farrington Highway to connect the DLNR Kualakai West parcels (TMK: 9-1-016: 008 and 9-1-018: 008) to the future Kualakai Trunk Sewer Extension. The D. R. Horton Gateway Lot (TMK: 9-1-018: 012) has permanent 24" sewer line crossing Farrington Highway and a temporary connection through the UHWO Makai sewer system, which will be disconnected when the Kualakai Trunk Sewer Extension

is constructed (Reference 1). The DLNR Kualakai East parcel (TMK: 9-1-018: 014) has a 15" stub to the permanent 24" sewer line crossing Farrington Highway, which will be connected to the future Kualakai Trunk Sewer Extension.

The estimated sewer equivalent population (EP), calculated from the previous approved sewer master plans and the anticipated development numbers for the East Kapolei developments, are summarized in Table 3.

Table 3 East Kapolei Sewer Equivalent Population

	Equivalent Population (EP)			
Developments	Previous Approved SMP	Anticipated EP DLNR Alternative 1	Anticipated EP DLNR Alternative 2	Anticipated EP DLNR Alternative 3
D. R. Horton Hoopili	54,775[1]	55,278	55,278	55,278
D. R. Horton Gateway Lot	1,840[1]	2,000[3]	2,000[3]	2,000[3]
DLNR Kualakai East	2,492[1]	3,526	2,576	3,294
DLNR Kualakai West		5,241	5,241	5,241
DLNR TOD Mixed Use	767[1]	3,383	3,803	4,578
DHHL Kauluokahai	7,652[2]	8,271	8,271	8,271
DHHL Kanehili	9,206[1]	4,010	4,010	4,010
Ka Makana Alii	5,500[1]	5,500[1]	5,500[1]	5,500[1]
Hawaii Tokai International College	N.A.	272[4]	272[4]	272[4]
UHWO Makai	21,915[1]	30,495[5]	30,495[5]	30,495[5]
UHWO Mauka[6]	23,550[1]	23,550[1]	23,550[1]	23,550[1]
D. R. Horton Mauka (formerly Campbell Estate)[6]	1,225[1]	1,225[1]	1,225[1]	1,225[1]
Total	128,922	142,751	142,221	143,714

[1]Wastewater Master Plan for East Kapolei (Reference 1)

[2]Wastewater Master Plan for East Kapolei II Development (Reference 3)

[3]Hoopili Sewerage Master Plan (Reference 2)

[4]Estimated existing equivalent population

[5]Based on the UHWO 2006 LRDP and the latest UHWO Makai development numbers

[6]Contributed sewer area mauka of H-1 Freeway per Reference 1. No development data is available at the time of this study.

An analysis of the existing regional sewer system capacity was performed with the anticipated sewer demands from the East Kapolei developments (Appendix A). The results show that regional sewer system improvements are required to support the developments in East Kapolei and the three proposed alternatives for the DLNR East Kapolei developments (Figure 6). The improvements are summarized below.

- Keahumoa Trunk Sewer Improvements:
  A portion of the existing Keahumoa Trunk Sewer requires upsizing from 36" to 42" due to the increase in equivalent populations from the developments of TOD Mixed Use, D. R. Horton Hoopili, and DHHL Kauluokahai. The timing and cost sharing of Keahumoa Trunk Sewer Improvements to support the new developments may occur in Phase 2 and it will require coordination from the aforementioned participating parties.

- Kualakai Trunk Sewer Extension:
  The existing Kualakai Trunk Sewer terminates at the intersection of Kualakai Parkway and Keahumoa Parkway and presently serves UHWO Makai and DHHL. This trunk sewer must be extended to the intersection of Kualakai Parkway and Farrington Highway with a 30" pipeline in order to support the Kualakai East and West developments. The construction of the Kualakai Trunk Sewer Extension is required to serve the DLNR parcels and is anticipated to occur in Phase 2 prior to the development of Kualakai West and Kualakai East.

- New 18" Farrington Highway Sewer:
  A new 18" sewer system along Farrington Highway connecting to the Kualakai Trunk Sewer Extension is required to provide sewer service for the Kualakai West developments. The construction of this new 18" sewer system is anticipated to occur in Phase 2 to 3 following the Kualakai West project schedule.

The existing regional systems, along with the aforementioned three new sewer system improvements, will provide adequate capacities for the developments by DLNR, D. R. Horton, DHHL, and UHWO Makai if the UHWO Mauka development is significantly downsized. The UHWO Mauka development equivalent population must be reduced by 17,175 based on the sewer capacity analysis, assuming no reduction in mauka D. R. Horton (formerly Campbell Estate). Without the downsizing of the UHWO Mauka development, the existing trunk sewers will have to be upgraded when the UHWO Mauka is developed.

- Kualakai Trunk Sewer Upgrade and the Kapolei Interceptor Sewer Upgrade:
  The existing Wastewater Master Plan for East Kapolei (References 1 to 3) provides sewer demands allocated to all the potential developments in the region by equivalent population. Due to the increase in equivalent populations from the anticipated DLNR, DHHL, D. R. Horton, and UHWO Makai developments as shown in Table 3, a portion of the existing Kualakai Trunk Sewer (30") and the Kapolei Interceptor Sewer (42") going to the Honouliuli Wastewater Treatment Plant will require upsizing to 36" and 48", respectively. The timing and cost sharing of the Trunk Sewer Upgrades to support the new developments may occur in Phase 2 and it will require coordination from the aforementioned participating parties.

B. Water System

The initial water system for East Kapolei was based on the master plan completed by Campbell Estate for the City of Kapolei, Makakilo, Ko Olina and the State. The master plan extended into East Kapolei by the State and recently updated by DHHL and D. R. Horton for Hoopili. This region uses a dual water system, potable and non-potable, and BWS has worked with the developers to create a dual water system standard.

The existing non-potable water available from BWS is limited by the amount of treated non-potable water available to the BWS water treatment facility. ENV and BWS are working to increase the amount of available non-potable water. In the interim, BWS is supplementing the non-potable water system with potable water. The BWS will only provide service for the 215-foot non-potable water system. Developers will have to provide their own booster pumps in order to use non-potable water from the 215-foot system in the 440-foot service area. The potable water system in UHWO Makai is situated within two service zones, 215-foot and 440-foot. The 215-foot service zone is integrated with the existing 215-foot service zone in the region, whereas the 440-foot service zone is in a separate water system from the surrounding area. UHWO included water demand for the makai and mauka campus in their 2006 Long Range Development Plan (LRDP), which was incorporated into the regional wastewater master plans by UHWO and D. R. Horton Hoopili.

Currently there is a 2.5-million gallon (MG) potable reservoir at elevation 440 feet providing water source for the UHWO site. A future 2.5 MG potable reservoir is planned next to the existing 2.5 MG reservoir. According to the UHWO Water Master Plan of the 440-foot Potable Water System (Figure 7, Reference 5), DLNR parcels (Parcels E, F1, F2, H1 and H2) will be served by the East Kapolei 440-foot potable water system reservoirs. While there is a transmission main, there is currently no master planned water distribution system to serve the four DLNR parcels. In order to determine when the additional 2.5 MG potable reservoir is required, the estimated water maximum daily demands for the UHWO East Kapolei 440-foot potable water system are summarized in Tables 4 and 5 (dual water system standard). The potable water system improvements required to serve these developments are shown in Figure 8.

Table 4 East Kapolei 440-Foot Potable Water System Maximum Daily Demands

	Maximum Daily Demand (MG)			
Developments	Previous Approved Water Master Plan[1]	Anticipated demand with DLNR Alternative 1	Anticipated demand with DLNR Alternative 2	Anticipated demand with DLNR Alternative 3
DLNR Kualakai West	0.2865[4]	0.211	0.211	0.211
DLNR Kualakai East	0.2328[5]	0.168	0.223	0.234
DLNR TOD Mixed Use	0.1644[6]	0.247	0.309	0.423
D. R. Horton Gateway Lot	0.2021[7]	0.123[2]	0.123[2]	0.123[2]
Hawaii Tokai International College	N.A.	0.007[8]	0.007[8]	0.007[8]
UHWO Makai	3.3213	2.688[3]	2.688[3]	2.688[3]
UHWO Mauka				
Total	4.207	3.444	3.561	3.686

[1]University of Hawaii West Oahu Water Master Plan of 440-Foot Potable Water System (Reference 5)

[2]Hoopili Water Master Plan (Reference 4)

[3]Based on the UHWO 2006 LRDP and the latest UHWO Makai development numbers

[4]See Figure 7 of this report, Area H1 and H2

[5]See Figure 7 of this report, AreaF1 and F2

[6]See Figure 7 of this report, Area E

[7]See Figure 7 of this report, Area G

[8]Estimated existing water demand

Table 5 Hoopili and East Kapolei 440-Foot Potable Water System Demand

	Maximum Daily Demand (MGD)					
	Existing	Phase 1	Phase 2	Phase 3	Total Planned	Total Existing and Planned
Hoopili 440-ft and 228-ft system	0.103	4.136	2.728	0.000	6.864	6.967
UHWO 440-ft system						
DLNR[1]	0.000	0.423	0.355	0.090	0.869	0.869
D.R. Horton Gateway Lot	0.000	0.123	0.000	0.000	0.123	0.123
Hawaii Tokai International College	0.007	0.000	0.000	0.000	0.000	0.007
UHWO Makai	0.092	0.406	0.735	0.735	1.876	1.968
Subtotal	0.099	0.953	1.090	0.825	2.868	2.966
UHWO Mauka	0.000	0.000	0.000	0.720	0.720	0.720
Total w/ UHWO Mauka	0.099	0.953	1.090	1.545	3.588	3.686

Note:
[1]Alternative 3: TOD Mixed Use, Kualakai East, and Kualakai West

For the TOD Mixed Use parcel, the on-site water system may connect to the existing 20" water line at the intersection of Farrington Highway and Kualakai Parkway, utilizing the East Kapolei Reservoir 440-foot system per the UHWO Water Master Plan (Figure 8). However, this will require construction of a new water line (approximately 800 linear feet) along Farrington Highway as well as coordination with BWS and UHWO. The on-site potable water connection to the BWS system is anticipated to be in Phase 1.

One potential alternative is the connection to the existing 12" potable water line at Hoopili Road "E" utilizing the Honouliuli Reservoir 440-foot system. This will reduce the demands from the East Kapolei Reservoir 440-foot system. However, this connection will require coordination with BWS and D. R. Horton provided that the Honouliuli Reservoir 440-foot system has adequate storage to accommodate the additional demands. The same existing 12" water line is currently interconnected to the East Kapolei 440-foot system near the intersection of Kualakai Parkway and Hoopili Road "E" with a water valve opened temporarily during the interim condition. When D. R. Horton completes the construction of a new tank for the Honouliuli Reservoir 440-foot system, the water valve will be closed and only activated during emergency condition.

A second potential alternative is utilizing the existing 12" potable water line for connection to the East Kapolei Reservoir 440-foot system and installing a valve separating the East Kapolei Reservoir 440-foot system and Honouliuli Reservoir 440-foot system. This will require coordination with BWS and D. R. Horton.

For the Kualakai East and Kualakai West parcels, the on-site water system shall connect to the East Kapolei Reservoir 440-foot system per the UHWO Water Master Plan. The on-site water connection to the BWS system is anticipated to be in Phases 2 and 3 following the project schedule.

According to Table 4, Alternative 3 will require the most water demand of the three alternatives. As such, an analysis was performed to determine the maximum water demand for the UHWO East Kapolei 440-foot potable water system under Alternative 3 and the results are provided in Table 5. Based on Table 5, the existing 2.5 MG potable reservoir can accommodate the developments through Phase 2 (maximum daily demand is 2.142 MG). An additional 2.5 MG potable reservoir is required in Phase 3 for the UHWO East Kapolei 440-foot potable water system in order to support the UHWO and DLNR developments. The project schedule and construction costs shall be coordinated between UHWO, DHHL and DLNR.

In addition, the BWS has one capital improvement project (CIP) planned for the potable water system in East Kapolei. The Ewa Shaft Tunnel Improvements will enhance the regional potable water supply and the construction is anticipated to occur in Phase 1 (not included in the DLNR infrastructure costs).

C. Drainage System

The DLNR East Kapolei parcels are within the Kaloi Gulch Watershed and two major gulches, Kaloi Gulch and Hunehune Gulch, carry runoff from mauka to makai (Figure 9). Kaloi Gulch is situated at the east portion of the project site and enters Kualakai East through existing two-12-foot x 12-foot box culverts under the H-1 Freeway. Kaloi Gulch continues south and enters TOD Mixed Use through an existing bridge crossing at Farrington Highway. Kaloi Gulch ultimately connects to the existing Kaloi Channel to the east of Kualakai Parkway. Similarly, Hunehune Gulch is situated at the western portion of the project site and passes Kualakai West through an existing 96" pipe culvert at H-1 Freeway and an existing bridge crossing at Farrington Highway. Downstream of Farrington Highway, Hunehune Gulch continues south to the UHWO Makai parcels (TMK: 9-1-016: 179, 220, 222 & 223). For both Kaloi Gulch and Hunehune Gulch, since the proposed channelization of these gulches will still direct storm runoff to the existing highway crossings, it is assumed that the upgraded crossings under Farrington Highway will be constructed by the Farrington Highway Improvements Project prior to Phase 2 and are not included in the cost estimate.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the project site is located in Zone D, an area of undetermined flood hazard. No flood hazard analysis was performed. However, the drainage improvements at Kaloi Gulch within the DLNR parcels and Hunehune Gulch within the DLNR and UHWO Makai parcels will

serve regional and project related purposes, thereby controlling the 100-year flood to reduce the flood hazard.

The drainage improvements at Kaloi Gulch and Hunehune Gulch within the DLNR parcels will consist of the following items and summarized in Tables 6 and 7.

Kaloi Gulch:

- Improvements to Kaloi Gulch along the existing alignment to contain the design flow of 4,780 cfs. A grass-lined channel with a bottom width of 60 feet and a depth of 10 feet with 3 feet of freeboard, with geofabric reinforcing materials to stabilize channel due to higher velocities during the 100-year storm is proposed within TOD Mixed Use and Kualaka East.
- New 4-15'x8' culvert crossing in Kualakai East internal road (TMK: 9-1-018: 014)
- For Alternatives 1 and 2, a new 4-15'x8' culvert crossing at the intersection of Kualakai Parkway and Farrington Highway. This is a heavily used, large intersection with multiple turn lanes and limited by-pass road options that will be difficult and costly to build.
- For Alternative 3, a new bridge at Farrington Highway to replace the existing bridge (assumed to be constructed by the Farrington Highway Improvements Project prior to Phase 2)

Table 6 Kaloi Gulch Drainage Improvements

Alternative 1	Alternative 2	Alternative 3
Realignment of Gulch with Grass Lined Channel improving the shape of the development lots	Realignment of Gulch with Grass Lined Channel improving the shape of the development lots	Grass Lined Channel in existing alignment
Culverts at Internal Road	Culverts at Internal Road	Culverts at Internal Road
New Culverts at the Intersection of Kualakai Parkway and Farrington Highway	New Culverts at the Intersection of Kualakai Parkway and Farrington Highway	Connection to new Kaloi Gulch Bridge constructed by the Farrington Highway Improvement Project

Hunehune Gulch

- Improvements and realignment to Hunehune Gulch to contain the design flow of 950 cfs and to redirect flow away from the exchanged land with D. R. Horton (Figures 2 to 4). A grass-lined channel with a bottom width of 50-feet and a depth of 2 feet with 3 feet of freeboard, with geofabric reinforcing materials to stabilize channel due to higher velocities during the 100-year storm is proposed within Kualakai West.
- New 15'x8' culvert crossing in Kualakai West internal road (TMK: 9-1-018:008)
- For all alternatives, a new culvert crossing at Farrington Highway to replace the existing culvert (assumed to be constructed by the Farrington Highway Improvements Project prior to Phase 2)

Table 7 Hunehune Gulch Drainage Improvements

Alternative 1	Alternative 2	Alternative 3
Partial Realignment of Gulch with Grass Lined Channel to avoid swapped land with Hoopili	Partial Realignment of Gulch with Grass Lined Channel to avoid swapped land with Hoopili	Partial Realignment of Gulch with Grass Lined Channel to avoid swapped land with Hoopili
Culverts at Internal Road	Culverts at Internal Road	Culverts at Internal Road
Connection to new Hunehune Gulch Bridge/Culvert constructed by the Farrington Highway Improvement Project	Connection to new Hunehune Gulch Bridge/Culvert constructed by the Farrington Highway Improvement Project	Connection to new Hunehune Gulch Bridge/Culvert constructed by the Farrington Highway Improvement Project

For the on-site drainage due to the additional impervious surfaces and to store the required water quality volumes, detention basins or underground chambers are required for each phase of the DLNR developments for flood control to retain the increased runoff volumes. The design recurrence interval is 10-year for drainage area of 100 acres or less using the rational method per the City's Storm Drainage Standards.

For the TOD Mixed Use area, the Honolulu Authority for Rapid Transportation (HART) is required to provide 1,000 parking stalls at the future park and ride site near the transit station (Figures 2 to 4). In order to accommodate this peak flow reduction requirement, detention basins are usually proposed. For the proposed at-grade parking lot, underground chambers are the preferred option since they can be installed under the proposed parking lot, provided no structures and buildings are placed directly above the underground chambers. The detention basin option may be considered in lieu of the more expensive underground chambers, however, it will reduce the total developable area in the parking lot by approximately 2 acres and may require a vertical parking structure to provide the required parking stalls. The detention basin is assumed to be 5-feet deep with 3H:1V side slopes.

For the Kualakai East area, the detention basin option will reduce the total developable area by approximately 2.1 acres (1.4 acres of light industrial area and 0.7 acres of multi-family area). The detention basin is assumed to be 5-feet deep with 3H:1V side slopes.

For the Kualakai West parcels (including proposed exchanged land), the detention basin option will reduce total developable area in the light industrial area by approximately 2.8 acres. The detention basin is assumed to be 5-feet deep with 3H:1V side slopes.

The final layout and sizes of the detention basin or underground chambers will be determined during the design phase.

The City adopted a new guideline, "Rules Relating to Water Quality", which became effective on August 16, 2017 and applyies to all development and land disturbing activities within the City and establish minimum requirements for the Best Management Practices (BMPs).

The DLNR developments will be classified as Priority A projects and a Storm Water Quality Report (SWQR) must be submitted to the Department of Planning and Permitting (DPP) for review and approval prior to issuance of a building, grading, grubbing, and/or stockpile permit for development.

Post-construction treatment control BMPs may include retention BMPs, biofiltration BMPs, and BMPs for alternative compliance. The location and method of the post-construction treatment control BMPs will be determined during the design phase.

For retention BMPs, detention basins or underground chambers mentioned in Section C can be used for both flood control and storm water quality purposes provided that the soil infiltration rate meets the minimum requirement of 0.5 in/hr and ground water table is below the detention basin and underground chambers' invert.

D. Roadway System

The H-1 Freeway is the primary corridor connecting West Oahu to downtown Honolulu and Kualakai Parkway and Farrington Highway are the two major regional roadways in the study area. Kualakai Parkway and Farrington Highway are the two major regional roadways at the project site. Kualakai Parkway is a divided highway with a raised median connecting H-1 Freeway and Kapolei Parkway, and is owned by the State of Hawaii. The City-owned portion of Farrington Highway, between Kapolei Golf Course and Fort Weaver Road, is a two-lane undivided highway. The City is currently in the planning stage for the Farrington Highway improvements project (CIP) and the draft Environment Assessment (EA) is expected to be completed in 2020 with anticipated construction in Phase 1. The Farrington Highway Widening project will widen the existing highway to 4 lanes (2 lanes in each direction) with potential for 6 lanes in the future, if warranted. The project will upgrade the existing drainage crossings including the Hunehune Gulch box culvert bridge crossing, Kaloi Gulch Bridge and the Honouliuli Gulch Bridge (not in this project area).

For the DLNR developments, the City will require a Transportation Impact Analysis Report (TIAR) to evaluate the potential traffic impacts to the region. Potential improvements may include major intersection and roadway improvements in the vicinity of the project sites that serve as regional and project related purposes. Four such intersections are identified in this study as potential improvements (Figures 2 to 4). The locations are subject to change depending on the final site layouts.

- One intersection at Farrington Highway connecting to the on-site backbone roads in TOD Mixed Use and Kualakai East.
- One intersection at Kualakai Parkway connecting to the on-site backbone roads in Kualakai East. D. R. Horton currently is working with the State of Hawaii Department of Transportation (HDOT) to improve the western portion of the intersection to be a signalized T-intersection. However, HDOT will require the T-intersection to be a right-in/right-out intersection if the traffic condition impacts the H-1 Freeway traffic flow in the future. The DLNR developments shall coordinate with HDOT to determine the scope of the intersection improvements during the design phase.

- Two intersections at Farrington Highway connecting to the on-site backbone roads in Kualakai West. The east intersection will connect the DLNR on-site backbone roads to the UHWO master planned backbone roads. The west intersection is to provide additional access to the project site from Farrington Highway. The final locations will be coordinated between DLNR and the City.

E. Electrical and Communication System

The Hawaiian Electric Company (HECO) is the main supplier of electricity on Oahu. Most of the island's power is generated by plants located on the west side of the island and delivered through 138 kilo-Volt (kV) transmission corridors, and then from transmission and distribution substations to utility customers. In general, a distribution system consisting of a blend of underground electric utility lines and overhead utility lines supported by wood joint poles serve the East Kapolei TOD area. HECO also has several overhead lines through the district that are part of their regional transmission and sub-transmission systems. These regional facilities interconnect HECO substations interspersed throughout the island of Oahu. Hawaiian Telcom and Spectrum also provide telecommunications services via these overhead and underground lines.

In the future all TOD areas will be part of the TOD Special Districts and new electric and telecommunications facilities will be required to be installed underground in Special Districts (ROH, Chapter 22). Existing overhead facilities installed prior to the addition of a station area to the TOD Special District may remain overhead and, if necessary, may be repaired and supplemented if such actions do not alter the character of such lines (i.e., HECO may replace or "up conductor" their lines but the voltage of these HECO distribution lines must remain the same).

HECO presently serves its residential, commercial and governmental customers in the East Kapolei TOD area from their 12-kilo-volt (kV) distribution system. The power source for the 12-kV system are HECO's existing Kaloi, Kapolei, Ewa Nui and Kamokila Substations. HECO is currently planning to construct a new substation, Hoopili Substation Site No. 2 and has a parcel near the existing Kroc Center which can be developed into the East Kapolei Substation. Additional tentative substation locations have been identified for the future development of Hoopili Substation Sites Nos. 1 and 3 both within the Hoopili Development and one additional substation site located within the University District Lands parcel.

For new developments, Hawaiian Telcom and Spectrum typically require developers to provide underground telecommunications duct system infrastructure ("support structures") but will provide the cabling at their cost. In the most common scenario, the cost of new electrical facilities that are triggered by specific development projects, while nominally the responsibility of HECO, are paid for with funds provided by the developers of projects requesting service. These funds consist of a refundable advance and a non-refundable contribution with the advance portion covering the cost of an "equivalent" overhead system and the non-refundable contribution reflecting the cost difference between an overhead system and an underground system. Over a 10-year period after construction of such projects, HECO reimburses, on a year-by-year basis, the project developers for a sum equivalent to the electricity usage charges

paid by the energized development during that year for the advance portion only. For relocation work, project developers are assessed 100% of the cost for the relocation work by all utility companies except for City and State project where relocation cost sharing is mandated by State Statute, City Ordinance and/or Legislation. Examples of such cost sharing are HRS 264-33 and Improvement Districts.

In the latter, cost for the relocation are prorated between the developers/property owners, the governmental agency and the utility companies through a negotiated formula. It is understood that another process, Community Funded Development, is being contemplated, but the cost sharing formula and funding mechanisms are still being developed.

The funding mechanisms and responsibilities for local electrical improvements initiated by the City, State, or HECO vary, depending on what the project entails and what type of electrical facility is being improved. In general, new developments such as DHHL's East Kapolei subdivisions and Hoopili are required to fund and construct the underground infrastructure associated with their respective developments.

The improvements proposed in this section focus primarily on electrical capacity because current telecommunication technology generally allows Hawaiian Telcom and Spectrum to provide additional capacity to accommodate growth without new infrastructure. These utility companies can also replace the existing overhead and underground legacy trunking facilities with fiber optic cables and supplement existing fiber optic cable facilities with additional structures where they are deemed necessary.

The necessary electrical improvements identified by this analysis are to increase the quantity of existing 12-kV distribution lines extending from existing or proposed distribution substations, provide additional 46-kV transmission line extensions for the proposed substations, and develop additional distribution substations.

During the master planning process for Hoopili, DHHL East Kapolei and the University District Lands, HECO substation needs were identified and sites were tentatively selected. As new commercial and residential developments are designed and constructed, HECO evaluates the impact of the electrical loads associated with these projects on their available distribution system capacity and, when additional distribution capacity is required, begins the 3-5 year process of: securing State Public Utilities Commission approval for the development of a new substation; budgeting the construction costs; designing the substation and 46 kV line extensions to the substation; and permitting the substation construction. If additional 46 kV sub-transmission capacity is required to support the new substation deployments, HECO would also need to identify where the 46 kV capacity would originate and the alignments for the new 46 kV infrastructure. It should be noted that, in general, the new substation development and the 46 kV infrastructure expansion are considered HECO "system" improvements i.e. HECO funds construction of these items. Most if not all of the 12 kV distribution system expansion costs would be the responsibility of the respective developers rather than a shared cost amenable to community development or improvement district funding.

It should be noted that, in general, new substation development, substation upgrades and the 46 kV infrastructure expansion are considered HECO "system" improvements i.e. HECO funds construction of these items. It should also be noted that the trigger expenditure amount requiring PUC oversight and approval is $2,500,000 of HECO rate-base funding and that some substation upgrades might fall under this amount. Deployment of a new substation and associated transmission lines require PUC approval.

Also, during the master planning process, HECO provides input for the complement of conduits that will be required to extend 12 kV underground distribution facilities from the proposed substation locations to provide electric power to the master planned development. This input becomes the basis for the commercial and residential construction plans. Similarly, HTCO and Charter provide their input for the conduit complements required for their respective systems.

To support the proposed substations and expansion of the existing substations, HECO would need to evaluate the capacity of its 46 kV infrastructure and determine whether an additional 46-kV transmission alignment and circuit would be needed. Based on the proximity of the Ewa Nui Transmission substation, if a new 46 kV circuit is required, it would emanate from there. It should be noted that once the East Kapolei TOD District is established, any 46 kV alignment being contemplated would need to be placed underground e.g. for the proposed substation embedded in the University District Lands parcel, if development occurs under the aegis of the established TOD District, all the 46 kV sub-transmission circuits feeding this substation would need to be placed underground.

F. Rough Order-of-Magnitude Infrastructure Costs

The rough order-of-magnitude (ROM) infrastructure costs to support the three alternative DLNR developments in East Kapolei are divided into three categories as follows:

- Regional improvements: Improvements that will provide benefits and enhancement to the region, not just for the specific project.
- Regional/project improvements: These are improvements consisting of onsite and/or offsite improvements that are required to support the project needs
- Project improvements: These are typical on-site improvements consisting of backbone roadway, drainage, sewer, water, landscape, electrical, storm water quality, and other ancillary developments.

The infrastructure costs (2019 dollars), not including building, demolition, and soft costs, are summarized in Table 6 and the detailed breakdown is included in Appendix B. As shown in Table 8, the infrastructure costs for Alternative 1, Alternative 2, and Alternative 3 are $214.1 million, $213.9 million, and $194.6 million, respectively. It should be noted that the costs of the regional/project sewer improvements and regional water improvements will have to be negotiated and shared among the developers whose developments impact the regional system. The same is true for the proposed upgrade to the HECO 46 kV Underground Duct System.

Table 8 ROM Infrastructure Costs

Items	Alternative 1	Alternative 2	Alternative 3
Sewer (Regional/Project Improvements)			
Kualakai Trunk Sewer Extension[1]	$5,789,000	$5,789,000	$5,789,000
Kualakai Trunk Sewer Upgrade[2]	$924,000	$924,000	$924,000
Kapolei Interceptor Sewer Upgrade[3]	$6,240,000	$6,240,000	$6,240,000
Keahumoa Trunk Sewer Improvements[4]	$3,301,000	$3,301,000	$3,301,000
Water (Regional Improvements)			
East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir[5]	$7,583,000	$7,583,000	$7,583,000
DLNR TOD Mixed Use (Regional/Project Improvements)			
Intersections (1 inters. at Farrington Hwy)	$5,750,000	$5,750,000	$5,750,000
Regional Drainage (Kaloi Gulch)	$1,399,000	$1,399,000	$1,523,000
DLNR TOD Mixed Use (Project Improvements)			
80' ROW Backbone Road	$26,885,000	$26,885,000	$26,885,000
Onsite Development	$21,790,000	$21,790,000	$21,674,000
Storm Water Quality Treatment	$4,370,000	$4,370,000	$4,140,000
New Water System along Farrington Highway Connecting to Existing 20" Water Main	$544,000	$544,000	$544,000
Non-Potable Water Booster Pump	$173,000	$173,000	$173,000
DLNR Kualakai East TMK: 9-1-18: 014 and Kualakai West TMK: 9-1-018: 008 (Regional/Project Improvements)			
Regional Drainage (Kaloi Gulch and Hunehune Gulch)	$28,931,000	$29,161,000	$9,098,000
DLNR Kualakai East TMK: 9-1-018: 014 and Kualakai West TMK: 9-1-018: 008 (Project Improvements)			
Intersections (1 inters. at Kualakai Parkway and 1 inters. at Farrington)	$11,500,000	$11,500,000	$11,500,000
60' ROW Backbone Road	$13,455,000	$13,973,000	$13,973,000
Onsite Development	$40,642,000	$39,797,000	$40,413,000
Storm Water Quality Treatment	$1,955,000	$1,840,000	$2,185,000
New 18” Sewer System along Farrington Highway	$1,390,000	$1,390,000	$1,390,000
Non-Potable Water Booster Pump	$173,000	$173,000	$173,000
Connection to Existing Non-Potable Water	$230,000	$230,000	$230,000
DLNR Kualakai West TMK: 9-1-016: 008 (Project Improvements)			
Intersections (1 inters. at Farrington Highway)	$5,750,000	$5,750,000	$5,750,000
60' ROW Backbone Road	$5,952,000	$5,952,000	$5,952,000
Onsite Development	$17,261,000	$17,261,000	$17,261,000
Storm Water Quality Treatment	$805,000	$805,000	$805,000
New 18” Sewer System along Farrington Highway	$1,127,000	$1,127,000	$1,127,000
Non-Potable Water Booster Pump	$173,000	$173,000	$173,000
Total	$214,092,000	$213,880,000	$194,556,000

Notes:

[1] Kualakai Trunk Sewer Extension: Improvements cost to be shared by DLNR, UHWO, and D. R. Horton.

[2] Kualakai Trunk Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL

[3] Kapolei Interceptor Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL.

[4] Keahumoa Trunk Sewer Improvements: Improvements cost to be shared by DLNR, D. R. Horton, and DHHL.

[5] East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir: Improvements cost to be shared by DLNR and UHWO.

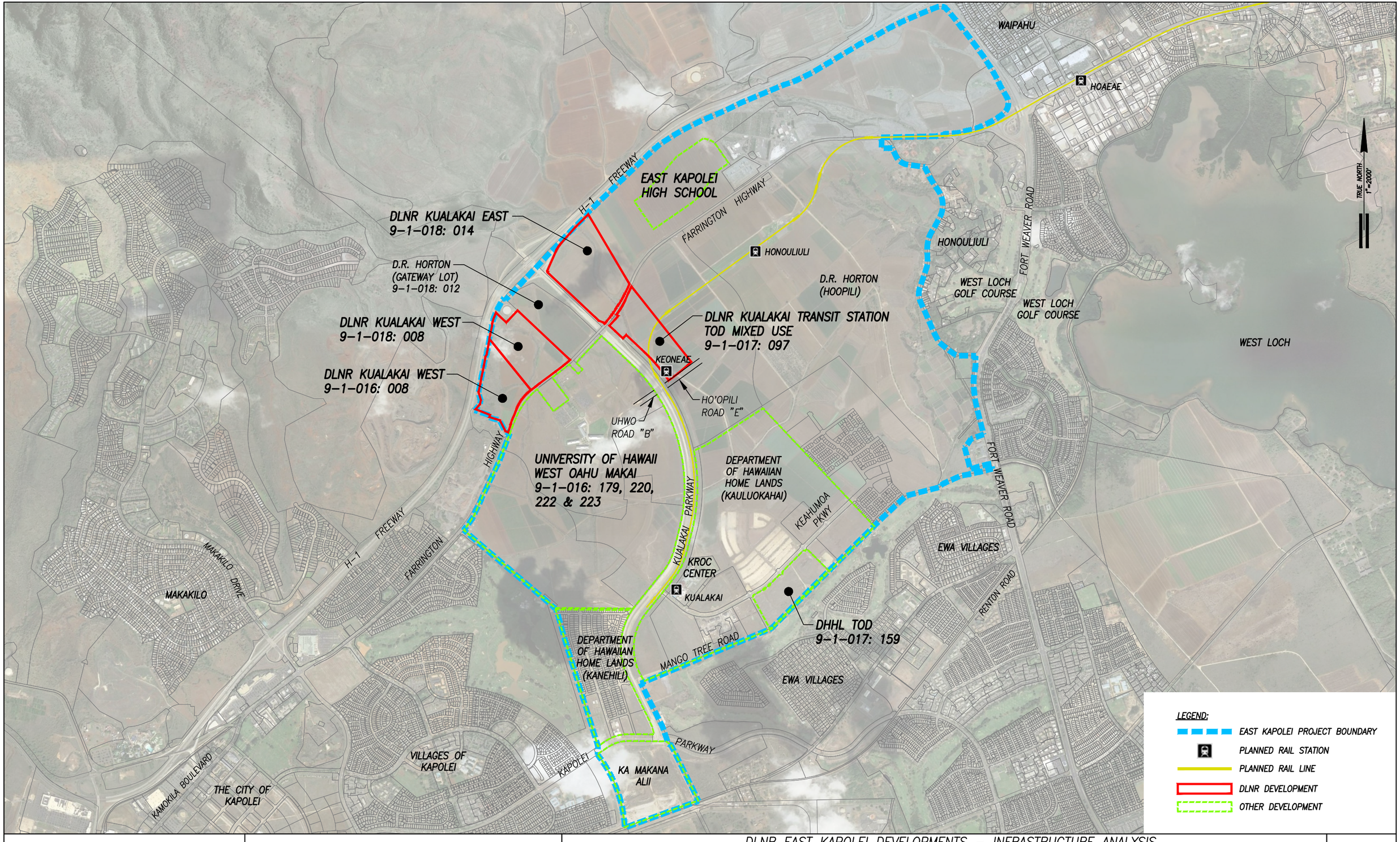
3. Conclusion for Site Utilities

In summary, all of the above estimated demands are based on the current standards. Depending on the final development plans, the utility requirements may differ. The final design shall be submitted to the City DPP, ENV, DTS, and/or HDOT-Highways Division for Sate of Hawaii roadway jurisdiction, and BWS for approval. Preliminary designs shall be submitted to determine the sewer and water availability. The preferred alternative attempts to maintain as much of Hunehune Gulch along its current alignment and does not alter the alignment of Kaloi Gulch which will allow the project to utilize the proposed upgrades to the existing crossings by the Farrington Highway Improvements Project which will result in a significant savings.

4. References

1. "Wastewater Master Plan for East Kapolei", Community Planning and Engineering, Inc., June 2006.
2. "Hoopili Sewerage Master Plan", R. M. Towill Corporation, November 6, 2017.
3. "Wastewater Master Plan for East Kapolei II Development", Community Planning and Engineering, Inc., January 2009.
4. "Hoopili Water Master Plan", R. M. Towill Corporation, August 4, 2015
5. "University of Hawaii West Oahu Water Master Plan of 440-Foot Potable Water System", Engineering Concepts, Inc., March 2007.
6. "The City of Kapolei Urban Design Plan", Group 70 International, Inc., November 2007.

FIGURES



Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3470

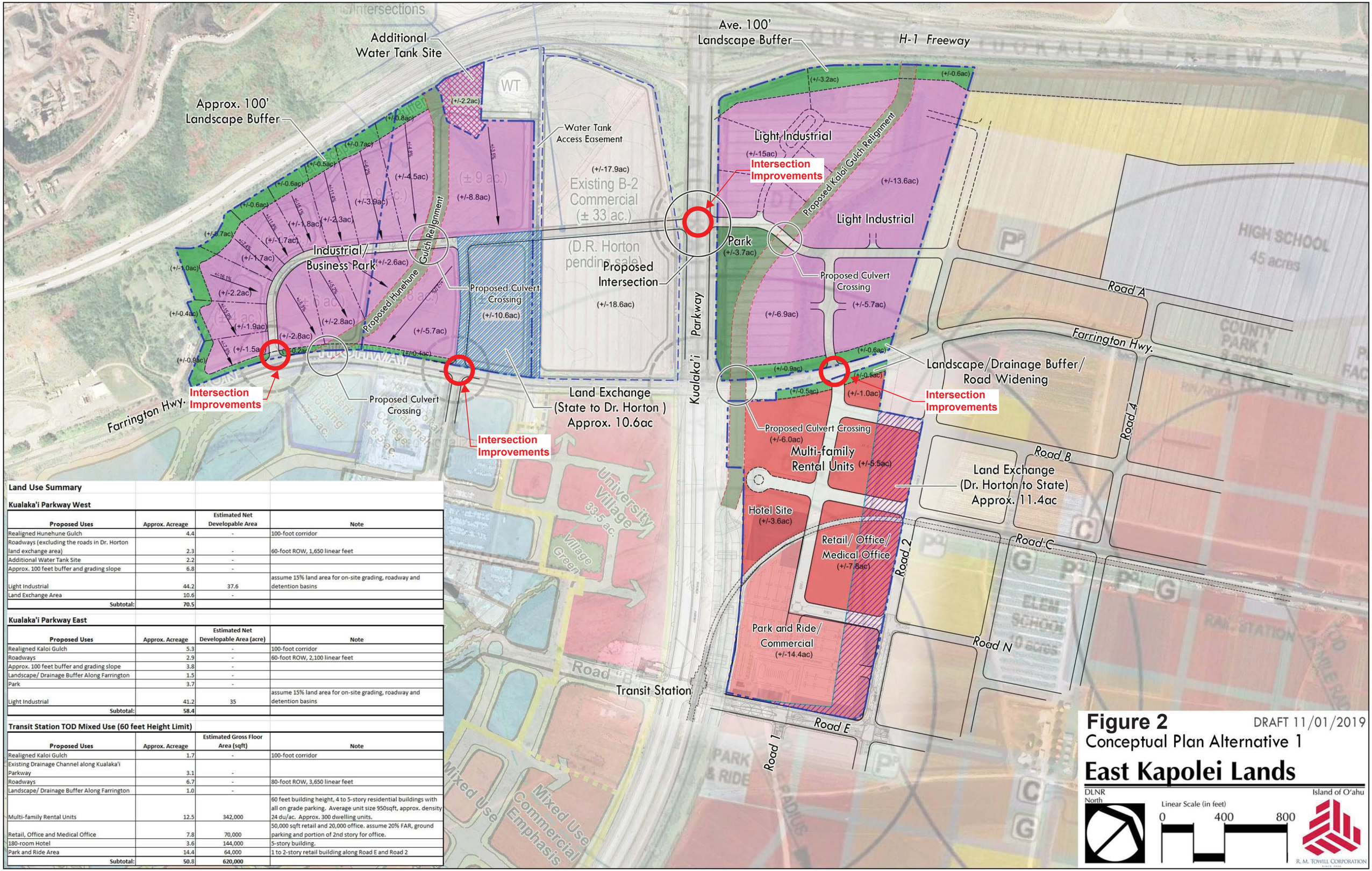
2000' 1000' 0 2000' 4000'

SCALE: 1" = 2000'

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS
HONOULIULI, EWA, OAHU, HAWAII

DLNR DEVELOPMENTS

FIGURE
1



Land Use Summary

Kualaka'i Parkway West

Proposed Uses	Approx. Acreage	Estimated Net Developable Area	Note
Realigned Hunehune Gulch	4.4	-	100-foot corridor
Roadways (excluding the roads in Dr. Horton land exchange area)	2.3	-	60-foot ROW, 1,650 linear feet
Additional Water Tank Site	2.2	-	
Approx. 100 feet buffer and grading slope	6.8	-	
Light Industrial	44.2	37.6	assume 15% land area for on-site grading, roadway and detention basins
Land Exchange Area	10.6	-	
Subtotal:	**70.5**		

Kualaka'i Parkway East

Proposed Uses	Approx. Acreage	Estimated Net Developable Area (acre)	Note
Realigned Kaloi Gulch	5.3	-	100-foot corridor
Roadways	2.9	-	60-foot ROW, 2,100 linear feet
Approx. 100 feet buffer and grading slope	3.8	-	
Landscape/ Drainage Buffer Along Farrington	1.5	-	
Park	3.7	-	
Light Industrial	41.2	35	assume 15% land area for on-site grading, roadway and detention basins
Subtotal:	**58.4**		

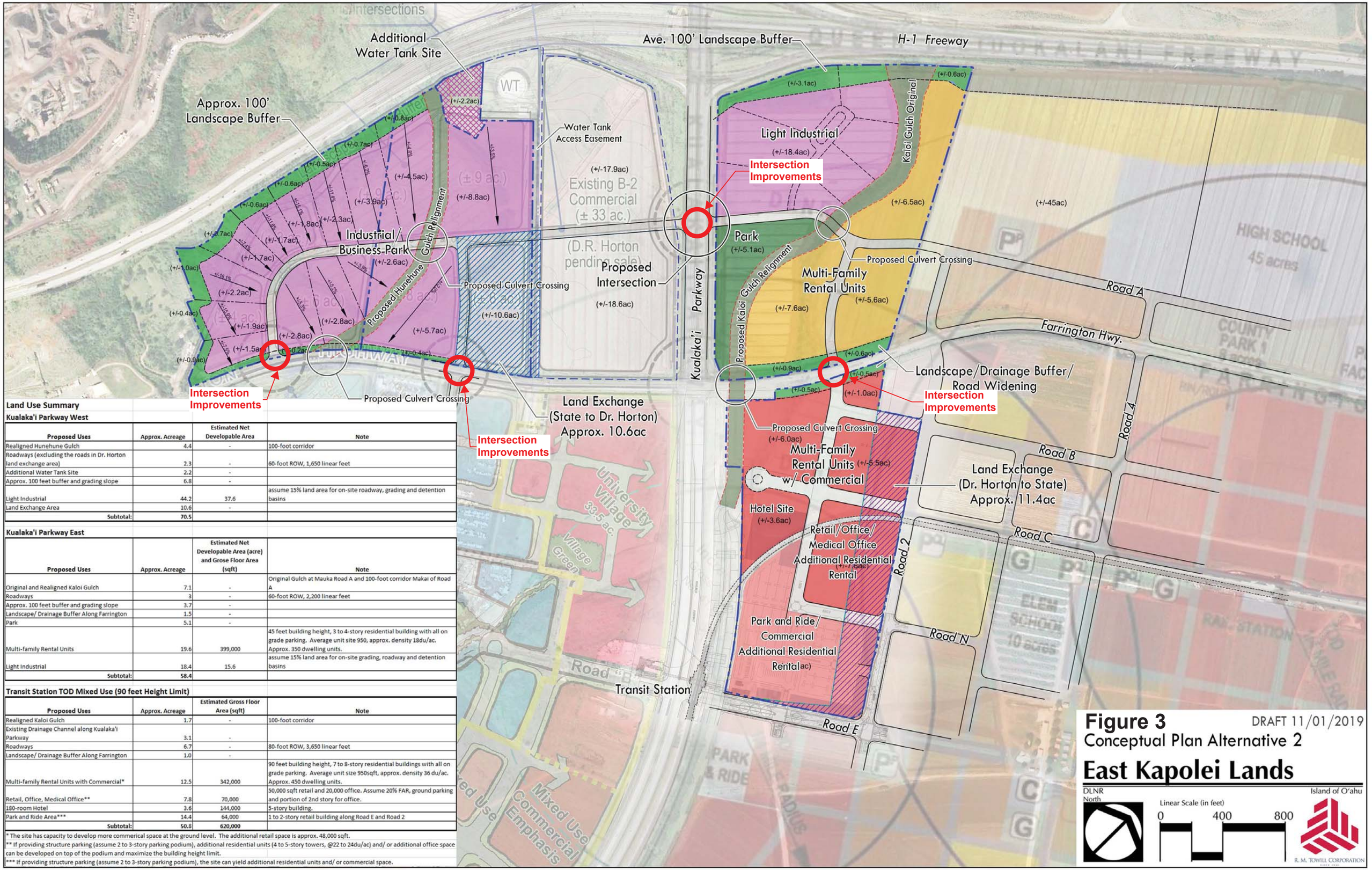
Transit Station TOD Mixed Use (60 feet Height Limit)

Proposed Uses	Approx. Acreage	Estimated Gross Floor Area (sqft)	Note
Realigned Kaloi Gulch	1.7	-	100-foot corridor
Existing Drainage Channel along Kualaka'i Parkway	3.1	-	
Roadways	6.7	-	80-foot ROW, 3,650 linear feet
Landscape/ Drainage Buffer Along Farrington	1.0	-	
Multi-family Rental Units	12.5	342,000	60 feet building height, 4 to 5-story residential buildings with all on grade parking. Average unit size 950sqft, approx. density 24 du/ac. Approx. 300 dwelling units.
Retail, Office and Medical Office	7.8	70,000	50,000 sqft retail and 20,000 office. assume 20% FAR, ground parking and portion of 2nd story for office.
180-room Hotel	3.6	144,000	5-story building.
Park and Ride Area	14.4	64,000	1 to 2-story retail building along Road E and Road 2
Subtotal:	**50.8**	**620,000**	

Figure 2 DRAFT 11/01/2019

Conceptual Plan Alternative 1

East Kapolei Lands



Land Use Summary

Kualaka'i Parkway West

Proposed Uses	Approx. Acreage	Estimated Net Developable Area	Note
Realigned Hunehune Gulch	4.4	-	100-foot corridor
Roadways (excluding the roads in Dr. Horton land exchange area)	2.3	-	60-foot ROW, 1,650 linear feet
Additional Water Tank Site	2.2	-	
Approx. 100 feet buffer and grading slope	6.8	-	
Light Industrial	44.2	37.6	assume 15% land area for on-site roadway, grading and detention basins
Land Exchange Area	10.6	-	
Subtotal:	**70.5**		

Kualaka'i Parkway East

Proposed Uses	Approx. Acreage	Estimated Net Developable Area (acre) and Grose Floor Area (sqft)	Note
Original and Realigned Kaloi Gulch	7.1	-	Original Gulch at Mauka Road A and 100-foot corridor Makai of Road A
Roadways	3	-	60-foot ROW, 2,200 linear feet
Approx. 100 feet buffer and grading slope	3.7	-	
Landscape/ Drainage Buffer Along Farrington	1.5	-	
Park	5.1	-	
Multi-family Rental Units	19.6	399,000	45 feet building height, 3 to 4-story residential building with all on grade parking. Average unit site 950, approx. density 18du/ac. Approx. 350 dwelling units.
Light Industrial	18.4	15.6	assume 15% land area for on-site grading, roadway and detention basins
Subtotal:	**58.4**		

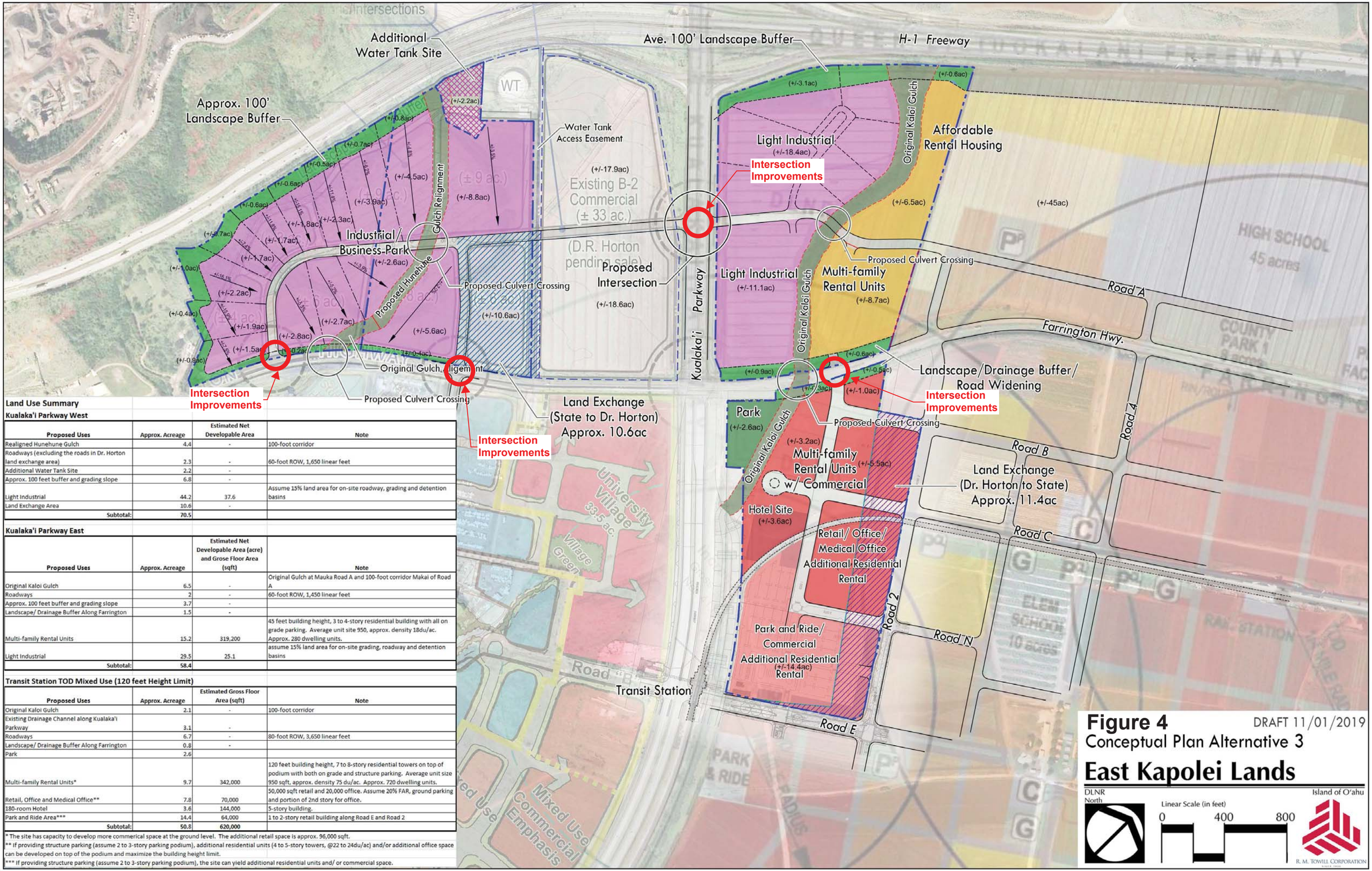
Transit Station TOD Mixed Use (90 feet Height Limit)

Proposed Uses	Approx. Acreage	Estimated Gross Floor Area (sqft)	Note
Realigned Kaloi Gulch	1.7	-	100-foot corridor
Existing Drainage Channel along Kualaka'i Parkway	3.1	-	
Roadways	6.7	-	80-foot ROW, 3,650 linear feet
Landscape/ Drainage Buffer Along Farrington	1.0	-	
Multi-family Rental Units with Commercial*	12.5	342,000	90 feet building height, 7 to 8-story residential buildings with all on grade parking. Average unit size 950sqft, approx. density 36 du/ac. Approx. 450 dwelling units.
Retail, Office, Medical Office**	7.8	70,000	50,000 sqft retail and 20,000 office. Assume 20% FAR, ground parking and portion of 2nd story for office.
180-room Hotel	3.6	144,000	5-story building.
Park and Ride Area***	14.4	64,000	1 to 2-story retail building along Road E and Road 2
Subtotal:	**50.8**	**620,000**	

* The site has capacity to develop more commerical space at the ground level. The additional retail space is approx. 48,000 sqft.

** If providing structure parking (assume 2 to 3-story parking podium), additional residential units (4 to 5-story towers, @22 to 24du/ac) and/ or additional office space can be developed on top of the podium and maximize the building height limit.

*** If providing structure parking (assume 2 to 3-story parking podium), the site can yield additional residential units and/ or commercial space.



Land Use Summary

Kualaka'i Parkway West

Proposed Uses	Approx. Acreage	Estimated Net Developable Area	Note
Realigned Hunehune Gulch	4.4	-	100-foot corridor
Roadways (excluding the roads in Dr. Horton land exchange area)	2.3	-	60-foot ROW, 1,650 linear feet
Additional Water Tank Site	2.2	-	
Approx. 100 feet buffer and grading slope	6.8	-	
Light Industrial	44.2	37.6	Assume 15% land area for on-site roadway, grading and detention basins
Land Exchange Area	10.6	-	
Subtotal:	**70.5**		

Kualaka'i Parkway East

Proposed Uses	Approx. Acreage	Estimated Net Developable Area (acre) and Grose Floor Area (sqft)	Note
Original Kaloi Gulch	6.5	-	Original Gulch at Mauka Road A and 100-foot corridor Makai of Road A
Roadways	2	-	60-foot ROW, 1,450 linear feet
Approx. 100 feet buffer and grading slope	3.7	-	
Landscape/ Drainage Buffer Along Farrington	1.5	-	
Multi-family Rental Units	15.2	319,200	45 feet building height, 3 to 4-story residential building with all on grade parking. Average unit site 950, approx. density 18du/ac. Approx. 280 dwelling units.
Light Industrial	29.5	25.1	assume 15% land area for on-site grading, roadway and detention basins
Subtotal:	**58.4**		

Transit Station TOD Mixed Use (120 feet Height Limit)

Proposed Uses	Approx. Acreage	Estimated Gross Floor Area (sqft)	Note
Original Kaloi Gulch	2.1	-	100-foot corridor
Existing Drainage Channel along Kualaka'i Parkway	3.1	-	
Roadways	6.7	-	80-foot ROW, 3,650 linear feet
Landscape/ Drainage Buffer Along Farrington	0.8	-	
Park	2.6		
Multi-family Rental Units*	9.7	342,000	120 feet building height, 7 to 8-story residential towers on top of podium with both on grade and structure parking. Average unit size 950 sqft, approx. density 75 du/ac. Approx. 720 dwelling units.
Retail, Office and Medical Office**	7.8	70,000	50,000 sqft retail and 20,000 office. Assume 20% FAR, ground parking and portion of 2nd story for office.
180-room Hotel	3.6	144,000	5-story building.
Park and Ride Area***	14.4	64,000	1 to 2-story retail building along Road E and Road 2
Subtotal:	**50.8**	**620,000**	

* The site has capacity to develop more commerical space at the ground level. The additional retail space is approx. 96,000 sqft.

** If providing structure parking (assume 2 to 3-story parking podium), additional residential units (4 to 5-story towers, @22 to 24du/ac) and/or additional office space can be developed on top of the podium and maximize the building height limit.

*** If providing structure parking (assume 2 to 3-story parking podium), the site can yield additional residential units and/ or commercial space.

Figure 4 DRAFT 11/01/2019

Conceptual Plan Alternative 3

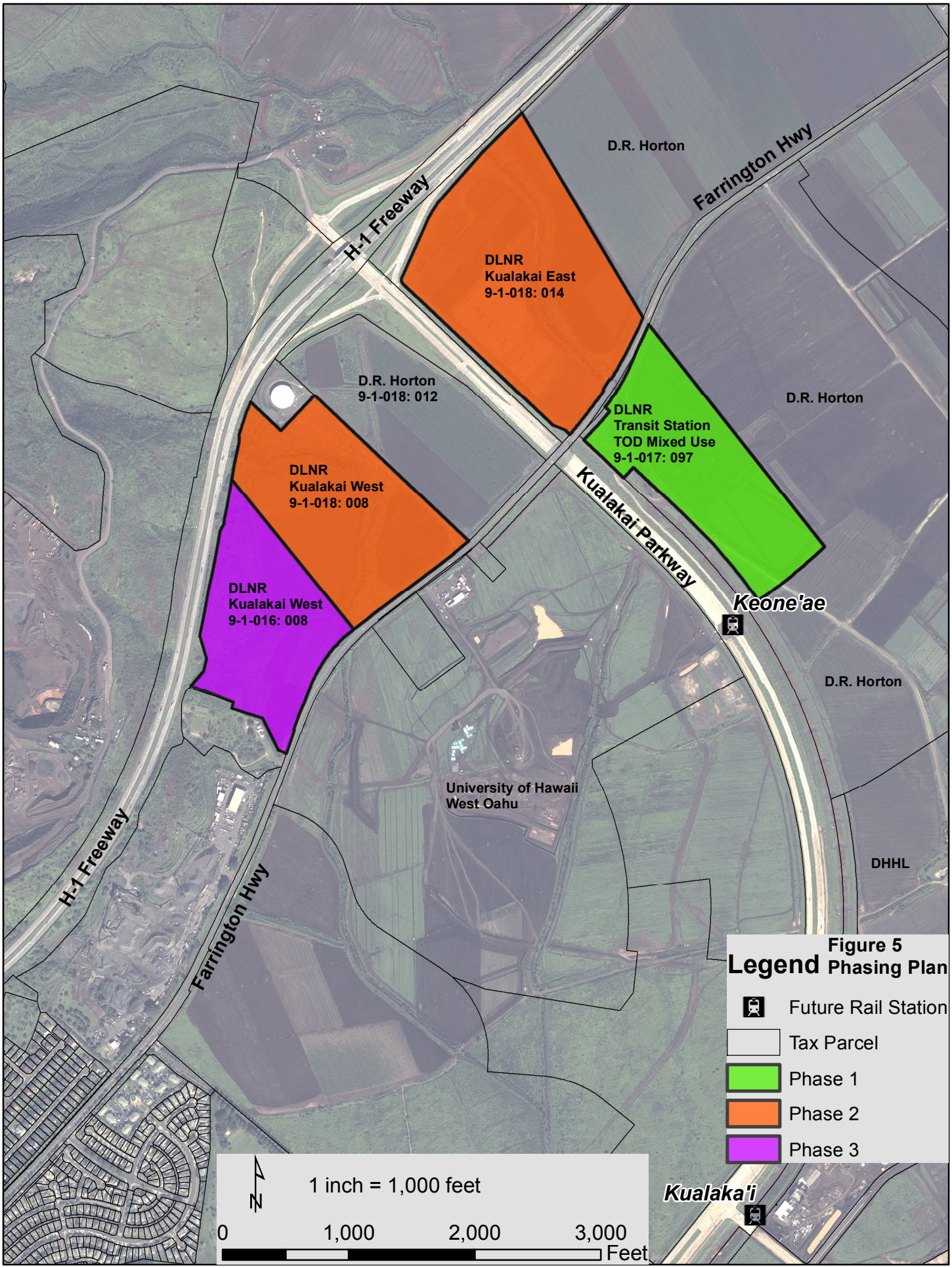
East Kapolei Lands

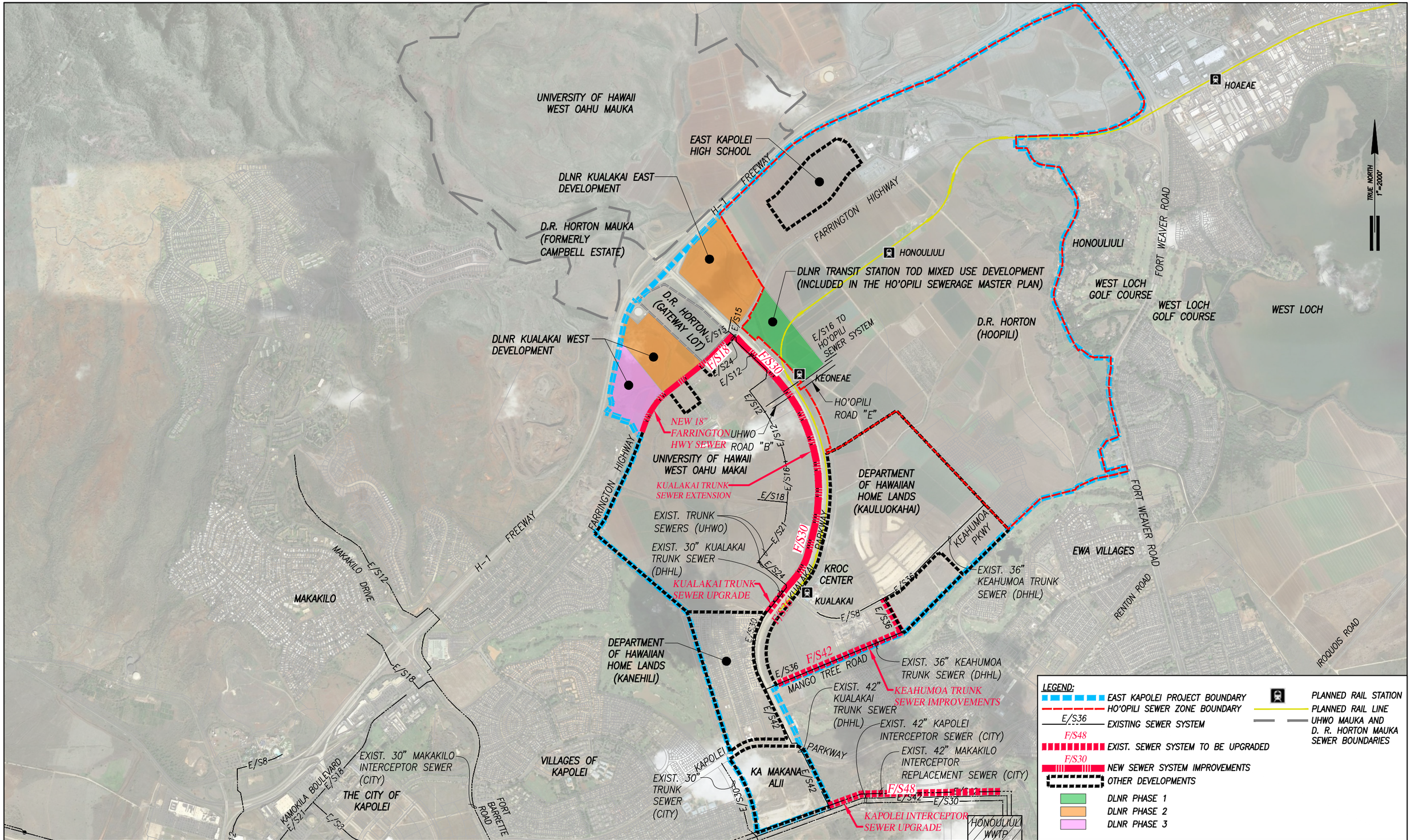
DLNR North

Linear Scale (in feet) 0 400 800

Island of O'ahu

R. M. TOWILL CORPORATION


D.R. Horton
Farrington Hwy
H-1 Freeway
DLNR
Kualakai East
9-1-018: 014
D.R. Horton
9-1-018: 012
D.R. Horton
DLNR
Transit Station
TOD Mixed Use
9-1-017: 097
DLNR
Kualakai West
9-1-018: 008
Kualakai Parkway
DLNR
Kualakai West
9-1-016: 008
Keone'ae
D.R. Horton
University of Hawaii
West Oahu
DHHL
H-1 Freeway
Farrington Hwy
Kualaka'i
Figure 5
Phasing Plan
Legend
Future Rail Station
Tax Parcel
Phase 1
Phase 2
Phase 3
N
1 inch = 1,000 feet
0
1,000
2,000
3,000
Feet



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2000' 1000' 0 2000' 4000'

SCALE: 1" = 2000'

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS

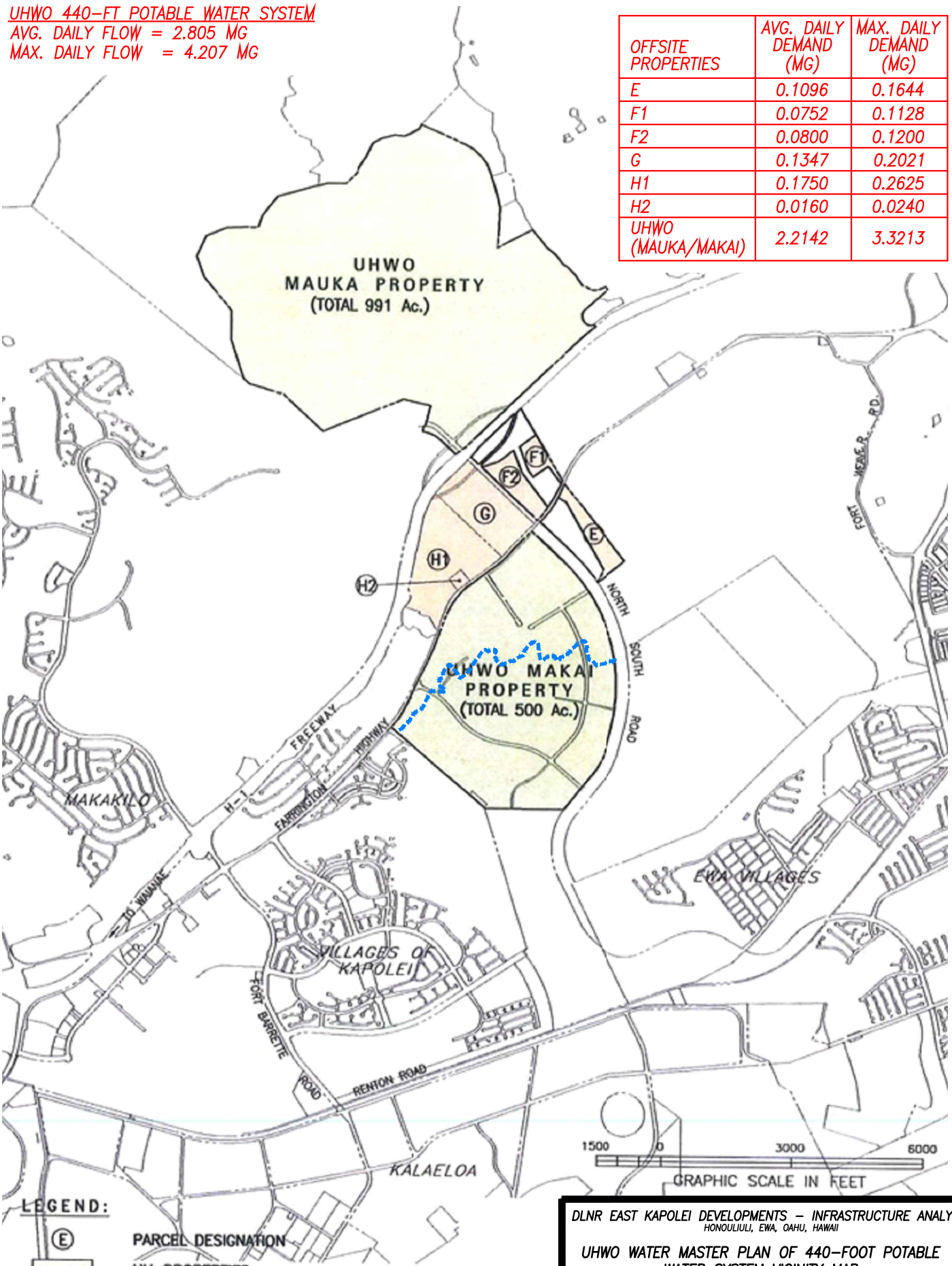
HONOULIULI, EWA, OAHU, HAWAII

SEWER SYSTEM IMPROVEMENTS

FIGURE 6

UHWO 440-FT POTABLE WATER SYSTEM
AVG. DAILY FLOW = 2.805 MG
MAX. DAILY FLOW = 4.207 MG

OFFSITE PROPERTIES	AVG. DAILY DEMAND (MG)	MAX. DAILY DEMAND (MG)
E	0.1096	0.1644
F1	0.0752	0.1128
F2	0.0800	0.1200
G	0.1347	0.2021
H1	0.1750	0.2625
H2	0.0160	0.0240
UHWO (MAUKA/MAKAI)	2.2142	3.3213

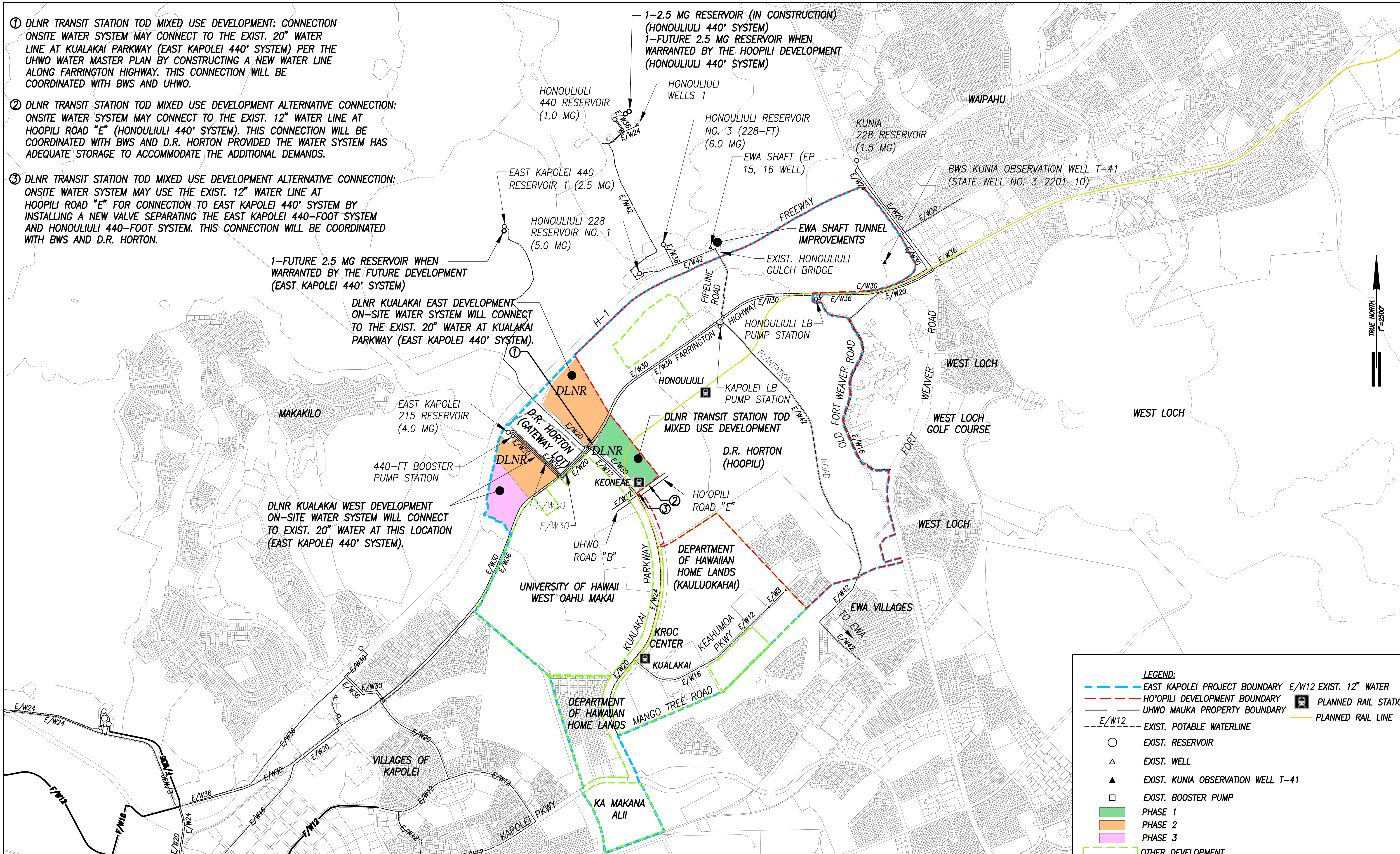


SOURCE: UNIVERSITY OF HAWAII WEST OAHU WATER MASTER PLAN OF 440-FOOT POTABLE WATER SYSTEM, MARCH 2007

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS
HONOULIULI, EWA, OAHU, HAWAII

UHWO WATER MASTER PLAN OF 440-FOOT POTABLE WATER SYSTEM VICINITY MAP

FIGURE 7



① DLNR TRANSIT STATION TOD MIXED USE DEVELOPMENT: CONNECTION ONSITE WATER SYSTEM MAY CONNECT TO THE EXIST. 20" WATER LINE AT KUALAKAI PARKWAY (EAST KAPOLEI 440' SYSTEM) PER THE UHWO WATER MASTER PLAN BY CONSTRUCTING A NEW WATER LINE ALONG FARRINGTON HIGHWAY. THIS CONNECTION WILL BE COORDINATED WITH BWS AND UHWO.
② DLNR TRANSIT STATION TOD MIXED USE DEVELOPMENT ALTERNATIVE CONNECTION: ONSITE WATER SYSTEM MAY CONNECT TO THE EXIST. 12" WATER LINE AT HOOPILI ROAD "E" (HONOULIULI 440' SYSTEM). THIS CONNECTION WILL BE COORDINATED WITH BWS AND D.R. HORTON PROVIDED THE WATER SYSTEM HAS ADEQUATE STORAGE TO ACCOMMODATE THE ADDITIONAL DEMANDS.
③ DLNR TRANSIT STATION TOD MIXED USE DEVELOPMENT ALTERNATIVE CONNECTION: ONSITE WATER SYSTEM MAY USE THE EXIST. 12" WATER LINE AT HOOPILI ROAD "E" FOR CONNECTION TO EAST KAPOLEI 440' SYSTEM BY INSTALLING A NEW VALVE SEPARATING THE EAST KAPOLEI 440-FOOT SYSTEM AND HONOULIULI 440-FOOT SYSTEM. THIS CONNECTION WILL BE COORDINATED WITH BWS AND D.R. HORTON.
1-2.5 MG RESERVOIR (IN CONSTRUCTION) (HONOULIULI 440' SYSTEM)
1-FUTURE 2.5 MG RESERVOIR WHEN WARRANTED BY THE HOOPILI DEVELOPMENT (HONOULIULI 440' SYSTEM)
HONOULIULI 440 RESERVOIR (1.0 MG)
HONOULIULI WELLS 1
HONOULIULI RESERVOIR NO. 3 (228-FT) (6.0 MG)
EWA SHAFT (EP 15, 16 WELL)
KUNIA 228 RESERVOIR (1.5 MG)
WAIPAHU
BWS KUNIA OBSERVATION WELL T-41 (STATE WELL NO. 3-2201-10)
EAST KAPOLEI 440 RESERVOIR 1 (2.5 MG)
HONOULIULI 228 RESERVOIR NO. 1 (5.0 MG)
EWA SHAFT TUNNEL IMPROVEMENTS
EXIST. HONOULIULI GULCH BRIDGE
FREEWAY
1-FUTURE 2.5 MG RESERVOIR WHEN WARRANTED BY THE FUTURE DEVELOPMENT (EAST KAPOLEI 440' SYSTEM)
DLNR KUALAKAI EAST DEVELOPMENT ON-SITE WATER SYSTEM WILL CONNECT TO THE EXIST. 20" WATER AT KUALAKAI PARKWAY (EAST KAPOLEI 440' SYSTEM).
H-1
PIPELINE ROAD
FARRINGTON HIGHWAY
HONOULIULI LB PUMP STATION
HONOULIULI
KAPOLEI LB PUMP STATION
PLANTATION ROAD
OLD FORT WEAVER ROAD
FORT WEAVER ROAD
WEST LOCH
WEST LOCH GOLF COURSE
MAKAKILO
EAST KAPOLEI 215 RESERVOIR (4.0 MG)
DLNR
D.R. HORTON (GATEWAY LOT)
DLNR TRANSIT STATION TOD MIXED USE DEVELOPMENT
D.R. HORTON (HOOPILI)
440-FT BOOSTER PUMP STATION
KEONEAE
HO'OPILI ROAD "E"
DLNR KUALAKAI WEST DEVELOPMENT ON-SITE WATER SYSTEM WILL CONNECT TO EXIST. 20" WATER AT THIS LOCATION (EAST KAPOLEI 440' SYSTEM).
UHWO ROAD "B"
DEPARTMENT OF HAWAIIAN HOME LANDS (KAULUOKAHAI)
UNIVERSITY OF HAWAII WEST OAHU MAKAI
KUALAKAI PARKWAY
KROC CENTER
KUALAKAI
KEAHUMOA PKWY
EWA VILLAGES
TO EWA
DEPARTMENT OF HAWAIIAN HOME LANDS
MANGO TREE ROAD
VILLAGES OF KAPOLEI
KAPOLEI PKWY
KA MAKANA ALII
E/W12 E/W16 E/W20 E/W24 E/W30 E/W36 E/W42 E/W8
TRUE NORTH 1"=2500'
LEGEND:
EAST KAPOLEI PROJECT BOUNDARY
HO'OPILI DEVELOPMENT BOUNDARY
UHWO MAUKA PROPERTY BOUNDARY
E/W12 EXIST. POTABLE WATERLINE
EXIST. RESERVOIR
EXIST. WELL
EXIST. KUNIA OBSERVATION WELL T-41
EXIST. BOOSTER PUMP
PHASE 1
PHASE 2
PHASE 3
OTHER DEVELOPMENT
E/W12 EXIST. 12" WATER
PLANNED RAIL STATION
PLANNED RAIL LINE

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2500' 1250' 0 2500' 5000'

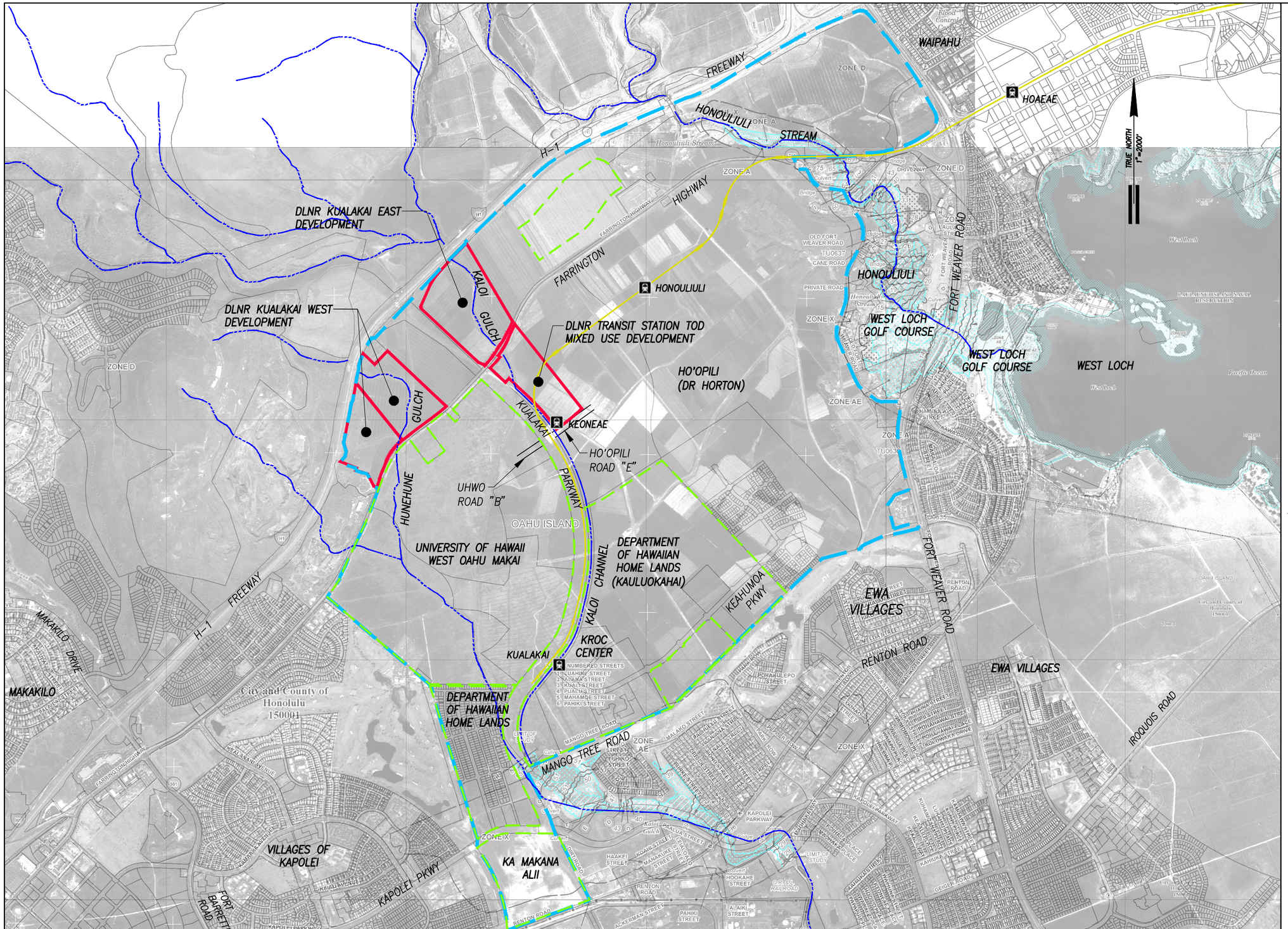
SCALE: 1" = 2500'

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS

HONOULIULI, EWA, OAHU, HAWAII

POTABLE WATER SYSTEM IMPROVEMENTS

FIGURE 8



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000 M 1000-meter Universal Transverse Mercator grid tick values, zone 4
- 600000 FT 5000-foot grid tick values: Hawaii State Plane coordinate system, zone 3 (FIPSZONE 5103), Transverse Mercator projection
- DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M 2 Coastal Mile marker

- EAST KAPOLEI PROJECT BOUNDARY
- PLANNED RAIL STATION
- PLANNED RAIL LINE
- DLNR DEVELOPMENT
- OTHER DEVELOPMENT
- STREAM

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2000' 1000' 0 2000' 4000'

SCALE: 1" = 2000'

DLNR EAST KAPOLEI DEVELOPMENTS – INFRASTRUCTURE ANALYSIS
HONOULIULI, EWA, OAHU, HAWAII

FLOOD INSURANCE RATE MAP (FIRM)

FIGURE 9

APPENDIX A

CALCULATIONS

EXISTING EAST KAPOLEI SEWER CAPACITY COMPUTATIONS (UPSIZE)

Sewer: **Kualakai Trunk Sewer**
District:
Reference Maps:

Computed By:
Date:

SEWER LOCATION			TRIBUTARY AREA (acres)		TRIBUTARY EQUIVALENT POPULATION												WASTEWATER FLOW COMPUTATION											SEWER STUDY							
					RESIDENTIAL				COMMERCIAL				OTHER			TOTAL										Q_R			n				Q_A			Q_R / Q_A
Point or SMH	Sub-Area Parcel	Land Use	Incr.	Total	Units	Inc. Cap. per unit	Capita	Total	Comm. Floor Area	Flr. Area/ SFPC or Cap./Acre	Capita	Total	Inc. Cap. per area	Capita	Total	Incr. Capita	Total	Avg per Capita Flow (gpcd)	Avg Flow (mgd)	Max Flow Factor	Max Flow (mgd)	Dry I/I Rate (gpcd)	Dry I/I (mgd)	Design Avg Flow (mgd)	Design Max Flow (mgd)	Wet I/I Rate (gad)	Wet I/I (mgd)	Design Peak Flow (mgd)	Pipe Dia. (in)	Pipe Slope	'n' value	AVERAGE Vel. (fps)	PEAK Vel. (fps)	FULL Vel. (fps)	Cap-acity (mgd)	Excess Cap. (mgd)	Excess %	%
S.L. "A5" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over from Mauka	1106.00				5,210						19565			24,775			1.982																		
		DR Horton Gateway Lot	38.10								2,000					2,000		80	0.160																		
		Kualakai Prkwy East & West	92.07													8,535		80	0.683																		
		TOTAL		1236.17													35310		2.825	2.45	6.924	5	0.177	3.001	7.101	1250	1.545	8.646	24	0.0070	0.013	5.03	6.53	6.02	12.232	3.586	29	71
S.L. "A4" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	1236.17													35,310			2.825																		
		TOTAL		1236.17													35310		2.825	2.45	6.924	5	0.177	3.001	7.101	1250	1.545	8.646	30	0.0028	0.013	3.58	4.68	4.42	14.027	5.381	38	62
S.L. "A3" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	1236.17													35,310			2.825																		
		S.L. "D" (less H1)	528.20													30,767		80	2.461																		
		TOTAL		1764.37													66077		5.286	2.16	11.431	5	0.330	5.617	11.762	1250	2.205	13.967	36	0.0028	0.013	4.18	5.25	4.99	22.809	8.842	39	61
S.L. "A2" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	1764.37													66,077			5.286																		
		Transit Station TOD Mixed Use	44.80													4,578		80	0.366																		
		S.L. "C"	1581.10													63,549		80	5.084																		
		TOTAL		3390.27													134204		10.736	1.88	20.150	5	0.671	11.407	20.821	1250	4.238	25.059	42	0.0030	0.013	5.17	6.24	5.73	35.614	10.555	30	70
S.L. "A1" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	3390.27													134,204			10.736																		
		S.L. "B"	92.10													4,010		80	0.321																		
		Central Business	100.00													5,500		80	0.440																		
		TOTAL		3582.37													143714		11.497	1.85	21.284	5	0.719	12.216	22.003	1250	4.478	26.481	42	0.0030	0.013	5.26	6.30	5.73	35.614	9.133	26	74
SECTION A (MAKAKILO INTERCEPTOR REPLACEMENT SEWER)																																				
		Flow Carry Over	3582.37													143,714			11.497																		
		Section B	4842.00													192,386		80	15.391																		
		Reservation For Section A	175.00													750		80	0.060																		
		TOTAL		8599.37													336850		26.948	1.56	42.074	5	1.684	28.632	43.758	1250	10.749	31.064	48	0.0028	0.013	6.25	6.43	6.02	48.859	17.795	36	64
HWWTP		Flow Carry Over	8599.37													336,850			26.948																		

PHASE 1

S.L. "A5" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over from Mauka	0.00				0						0			0			0.000																		
		DR Horton Gateway Lot	38.10								2,000					2,000		80	0.160																		
		Kualakai Prkwy East & West	0.00													0		80	0.000																		
		TOTAL		38.10													2000		0.160	4.35	0.696	5	0.010	0.170	0.706	1250	0.048	0.754	24	0.0070	0.013	2.24	3.44	6.02	12.232	11.478	94	6
S.L. "A4" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	38.10													2,000			0.160																		
		TOTAL		38.10													2000		0.160	4.35	0.696	5	0.010	0.170	0.706	1250	0.048	0.754	30	0.0028	0.013	1.57	2.41	4.42	14.027	13.273	95	5
S.L. "A3" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	38.10													2,000			0.160																		
		S.L. "D" (less H1)	160.00													7,279		80	0.582																		
		TOTAL		198.10													9279		0.742	3.20	2.377	5	0.046	0.789	2.424	1250	0.248	2.671	30	0.0028	0.013	2.41	3.42	4.42	14.027	11.356	81	19
S.L. "A2" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	198.10													9,279			0.742																		
		Transit Station TOD Mixed Use	44.80													4,578		80	0.366																		
		S.L. "C"	1149.40													45,393		80	3.631																		
		TOTAL		1392.30													59250		4.740	2.21	10.476	5	0.296	5.036	10.773	1250	1.740	12.513	42	0.0030	0.013	4.14	5.30	5.73	35.614	23.101	65	35
S.L. "A1" (EAST KAPOLEI WASTEWATER MP)																																				
		Flow Carry Over	1392.30													59,250			4.740																		
		S.L. "B"	92.10													4,010		80	0.321																		
		Central Business	100.00													5,500		80	0.440																		
		TOTAL		1584.40													68760		5.501	2.15	11.801	5	0.344	5.845	12.145	1250	1.981	14.126	42	0.0030	0.013	4.31	5.44	5.73	35.614	21.488	60	40
SECTION A (MAKAKILO INTERCEPTOR REPLACEMENT SEWER)																																				
		Flow Carry Over	1584.40													68,760			5.501																		
		Section B	4842.00													192,386		80	15.391																		
		Reservation For Section A	175.00													750		80	0.060																		
		TOTAL		6601.40													261896		20.952	1.64	34.400	5	1.309	22.261	35.710	1250	8.252	20.519	42	0.0028	0.013	5.89	5.78	5.50	34.221	13.703	40	60
HWWTP		Flow Carry Over	6601.40													261,896			20.952																		

EXISTING EAST KAPOLEI SEWER CAPACITY COMPUTATIONS (UPSIZE)

Sewer: **Kualakai Trunk Sewer**
District:
Reference Maps:

Computed By:
Date:

SEWER LOCATION			TRIBUTARY AREA (acres)		TRIBUTARY EQUIVALENT POPULATION													WASTEWATER FLOW COMPUTATION											SEWER STUDY								
					RESIDENTIAL				COMMERCIAL				OTHER			TOTAL											Q_R			n				Q_A			Q_R / Q_A
Point or SMH	Sub-Area Parcel	Land Use	Incr.	Total	Units	Inc. Cap. per unit	Capita	Total	Comm. Floor Area	Flr. Area/ SFPC or Cap./Acre	Capita	Total	Inc. Cap. per area	Capita	Total	Incr. Capita	Total	Avg per Capita Flow (gpcd)	Avg Flow (mgd)	Max Flow Factor	Max Flow (mgd)	Dry I/I Rate (gpcd)	Dry I/I (mgd)	Design Avg Flow (mgd)	Design Max Flow (mgd)	Wet I/I Rate (gad)	Wet I/I (mgd)	Design Peak Flow (mgd)	Pipe Dia. (in)	Pipe Slope	'n' value	AVERAGE Vel. (fps)	PEAK Vel. (fps)	FULL Vel. (fps)	Cap-acity (mgd)	Excess Cap. (mgd)	Excess %	%
PHASE 2																																					
S.L. "A5" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over from Mauka	0.00				0							0		0			0.000																		
		DR Horton Gateway Lot	38.10								2,000					2,000		80	0.160																		
		Kualakai Prkwy East & West	71.27													6,614		80	0.529																		
		TOTAL		109.37													8614		0.689	3.25	2.240	5	0.043	0.732	2.283	1250	0.137	2.420	24	0.0070	0.013	3.34	4.72	6.02	12.232	9.812	80	20
S.L. "A4" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	109.37													8,614			0.689																		
		TOTAL		109.37													8614		0.689	3.25	2.240	5	0.043	0.732	2.283	1250	0.137	2.420	30	0.0028	0.013	2.34	3.33	4.42	14.027	11.607	83	17
S.L. "A3" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	109.37													8,614			0.689																		
		S.L. "D" (less H1)	325.00													19,023		80	1.522																		
		TOTAL		434.37													27637		2.211	2.57	5.692	5	0.138	2.349	5.830	1250	0.543	6.373	30	0.0028	0.013	3.31	4.35	4.42	14.027	7.654	55	45
S.L. "A2" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	434.37													27,637			2.211																		
		Transit Station TOD Mixed Use	44.80													4,578		80	0.366																		
		S.L. "C"	1581.60													63,548		80	5.084																		
		TOTAL		2060.77													95763		7.661	2.01	15.382	5	0.479	8.140	15.861	1250	2.576	18.437	42	0.0030	0.013	4.64	5.78	5.73	35.614	17.177	48	52
S.L. "A1" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	2060.77													95,763			7.661																		
		S.L. "B"	92.10													4,010		80	0.321																		
		Central Business	100.00													5,500		80	0.440																		
		TOTAL		2252.87													105273		8.422	1.97	16.593	5	0.526	8.948	17.119	1250	2.816	19.935	42	0.0030	0.013	4.80	5.88	5.73	35.614	15.679	44	56
SECTION A (MAKAKILO INTERCEPTOR REPLACEMENT SEWER)																																					
		Flow Carry Over	2252.87													105,273			8.422																		
		Section B	4842.00													192,386		80	15.391																		
		Reservation For Section A	175.00													750		80	0.060																		
		TOTAL		7269.87													298409		23.873	1.60	38.186	5	1.492	25.365	39.679	1250	9.087	25.323	42	0.0028	0.013	6.03	6.08	5.50	34.221	8.898	26	74
HWWTP		Flow Carry Over	7269.87													298,409			23.873																		
PHASE 3																																					
S.L. "A5" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over from Mauka	1106.00				5,210							19565		24,775			1.982																		
		DR Horton Gateway Lot	38.10								2,000					2,000		80	0.160																		
		Kualakai Prkwy East & West	92.07													8,535		80	0.683																		
		TOTAL		1236.17													35310		2.825	2.45	6.924	5	0.177	3.001	7.101	1250	1.545	8.646	24	0.0070	0.013	5.03	6.53	6.02	12.232	3.586	29	71
S.L. "A4" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	1236.17													35,310			2.825																		
		TOTAL		1236.17													35310		2.825	2.45	6.924	5	0.177	3.001	7.101	1250	1.545	8.646	30	0.0028	0.013	3.58	4.68	4.42	14.027	5.381	38	62
S.L. "A3" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	1236.17													35,310			2.825																		
		S.L. "D" (less H1)	490.00													30,767		80	2.461																		
		TOTAL		1726.17													66077		5.286	2.16	11.431	5	0.330	5.617	11.762	1250	2.158	13.920	36	0.0028	0.013	4.18	5.28	4.99	22.809	8.890	39	61
S.L. "A2" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	1726.17													66,077			5.286																		
		Transit Station TOD Mixed Use	44.80													4,578		80	0.366																		
		S.L. "C"	1581.60													63,548		80	5.084																		
		TOTAL		3352.57													134203		10.736	1.88	20.150	5	0.671	11.407	20.821	1250	4.191	25.011	42	0.0030	0.013	5.17	6.23	5.73	35.614	10.602	30	70
S.L. "A1" (EAST KAPOLEI WASTEWATER MP)																																					
		Flow Carry Over	3352.57													134,203			10.736																		
		S.L. "B"	92.10													4,010		80	0.321																		
		Central Business	100.00													5,500		80	0.440																		
		TOTAL		3544.67													143713		11.497	1.85	21.284	5	0.719	12.216	22.003	1250	4.431	26.434	42	0.0030	0.013	5.26	6.29	5.73	35.614	9.180	26	74
SECTION A (MAKAKILO INTERCEPTOR REPLACEMENT SEWER)																																					
		Flow Carry Over	3544.67													143,713			11.497																		
		Section B	4842.00													192,386		80	15.391																		
		Reservation For Section A	175.00													750		80	0.060																		
		TOTAL		8561.67													336849		26.948	1.56	42.073	5	1.684	28.632	43.758	1250	10.702	31.017	48	0.0028	0.013	6.25	6.42	6.02	48.859	17.842	37	63
HWWTP		Flow Carry Over	8561.67													336,849			26.948																		

Assumptions

1. The following reports are referenced.
   * "Wastewater Master Plan for East Kapolei", Community Planning and Engineering, Inc., June 2006.
   * "Wastewater Master Plan for East Kapolei II Development", Community Planning and Engineering, Inc., January 2009
   * "Hoopili Sewerage Master Plan", R. M. Towill Corporation, November 6, 2017
2. Use DLNR Preferred Alternative 3 for Kualakai Parkway East & West, and Transit Station TOD Mixed Use
3. Kualakai Parkway Transit Station TOD Mixed Use to be sewered through Ho'opili
4. For SL "A2", approximately 750 LF requires upgrade from 30" to 36" if sewer demands were to follow Table 2.
5. For Section A SL, approximately 4,000 LF requires upgrade from 42" to 48" if sewer demands were to follow Table 2.

EXISTING EAST KAPOLEI II SEWER CAPACITY COMPUTATIONS

Sewer: **Keahumoa Trunk Sewer**
District:
Reference Maps:

Computed By:
Date:

SEWER LOCATION			TRIBUTARY AREA (acres)		TRIBUTARY EQUIVALENT POPULATION														WASTEWATER FLOW COMPUTATION											SEWER STUDY							
					RESIDENTIAL				COMMERICAL				OTHER				TOTAL											Q_R			n				Q_A		Q_R / Q_A
Point or SMH	Sub-Area Parcel	Land Use	Incr.	Total	Units	Inc. Cap. per unit	Capita	Total	Comm. Floor Area	Flr. Area/ SFPC or Cap./Acre	Capita	Total	Inc. Cap. per area	Capita	Total	Incr. Capita	Total	Avg per Capita Flow (gpcd)	Avg Flow (mgd)	Max Flow Factor	Max Flow (mgd)	Dry I/I Rate (gpcd)	Dry I/I (mgd)	Design Avg Flow (mgd)	Design Max Flow (mgd)	Wet I/I Rate (gad)	Wet I/I (mgd)	Design Peak Flow (mgd)	Pipe Dia. (in)	Pipe Slope	'n' value	AVERAGE FLOW Vel. (fps)	PEAK FLOW Vel. (fps)	FULL FLOW Vel. (fps)	Cap-acity (mgd)	Excess Cap. (mgd)	%
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over from Ho'opili	1243.00													59,496			4.760																		
		C16	19.70													560		80	0.045																		
		TOTAL		1262.70													60056		4.804	2.20	10.590	5	0.300	5.105	10.891	1250	1.578	12.469	36	0.0013	0.013	3.09	3.80	3.40	15.542	3.073	80
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1262.70													60,056			4.804																		
		C15	2.80													6		80	0.000																		
		Flow Carry Over from S.L. "C4"	101.90													2,512		80	0.201																		
		TOTAL		1367.40													62574		5.006	2.19	10.944	5	0.313	5.319	11.257	1250	1.709	12.966	36	0.0013	0.013	3.12	3.83	3.40	15.542	2.576	83
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1367.40													62,574			5.006																		
		Flow Carry Over from S.L. "C3"	35.80													1,117		80	0.089																		
		TOTAL		1403.20													63691		5.095	2.18	11.100	5	0.318	5.414	11.418	1250	1.754	13.172	36	0.0014	0.013	3.23	3.95	3.53	16.129	2.956	82
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1403.20													63,691			5.095																		
		Flow Carry Over from S.L. "C2"	60.10													1,560		80	0.125																		
		Flow Carry Over from S.L. "C1"	55.10													1,088		80	0.087																		
		TOTAL		1518.40													66339		5.307	2.16	11.468	5	0.332	5.639	11.799	1250	1.898	13.697	36	0.0014	0.013	3.25	3.98	3.53	16.129	2.431	85
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1518.40													66,339			5.307																		
		C3	32.60													628		80	0.050																		
		TOTAL		1551.00													66967		5.357	2.16	11.554	5	0.335	5.692	11.889	1250	1.939	13.828	42	0.0014	0.013	3.25	4.03	3.91	24.329	10.501	57
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1551.00													66,967			5.357																		
		C1B	30.10													800		80	0.064																		
		TOTAL		1581.10													67767		5.421	2.15	11.665	5	0.339	5.760	12.004	1250	1.976	13.980	42	0.0014	0.013	3.22	4.08	3.91	24.329	10.349	57
EX. S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1581.10													67,767			5.421																		
		TOTAL		1581.10													67767		5.421	2.15	11.665	5	0.339	5.760	12.004	1250	1.976	13.980	36	0.0030	0.013	4.29	5.42	5.17	23.610	9.630	59
EX. S.L. "C"		Flow Carry Over	1581.10													67,767			5.421																		

EXISTING EAST KAPOLEI II SEWER CAPACITY COMPUTATIONS

Sewer: **Keahumoa Trunk Sewer**
District:
Reference Maps:

Computed By:
Date:

SEWER LOCATION			TRIBUTARY AREA (acres)		TRIBUTARY EQUIVALENT POPULATION														WASTEWATER FLOW COMPUTATION											SEWER STUDY							
					RESIDENTIAL				COMMERICAL				OTHER			TOTAL												Q_R			n				Q_A		Q_R / Q_A
Point or SMH	Sub-Area Parcel	Land Use	Incr.	Total	Units	Inc. Cap. per unit	Capita	Total	Comm. Floor Area	Flr. Area/ SFPC or Cap./Acre	Capita	Total	Inc. Cap. per area	Capita	Total	Incr. Capita	Total	Avg per Capita Flow (gpcd)	Avg Flow (mgd)	Max Flow Factor	Max Flow (mgd)	Dry I/I Rate (gpcd)	Dry I/I (mgd)	Design Avg Flow (mgd)	Design Max Flow (mgd)	Wet I/I Rate (gad)	Wet I/I (mgd)	Design Peak Flow (mgd)	Pipe Dia. (in)	Pipe Slope	'n' value	AVERAGE FLOW Vel. (fps)	PEAK FLOW Vel. (fps)	FULL FLOW Vel. (fps)	Cap-acity (mgd)	Excess Cap. (mgd)	%
PHASE 1																																				
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over from Ho'opili	788.70													40,578			3.246																	
		C16	19.70													560		80	0.045																	
		TOTAL		808.40													41138		3.291	2.38	7.824	5	0.206	3.497	8.030	1250	1.011	9.041	36	0.0013	0.013	2.77	3.55	3.40	15.542	6.501	58
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	808.40													41,138			3.291																	
		C15	2.80													6		80	0.000																	
		Flow Carry Over from S.L. "C4"	101.90													2,512		80	0.201																	
		TOTAL		913.10													43656		3.492	2.35	8.205	5	0.218	3.711	8.424	1250	1.141	9.565	36	0.0013	0.013	2.82	3.59	3.40	15.542	5.977	62
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	913.10													43,656			3.492																	
		Flow Carry Over from S.L. "C3"	35.80													1,117		80	0.089																	
		TOTAL		948.90													44773		3.582	2.34	8.373	5	0.224	3.806	8.597	1250	1.186	9.783	36	0.0014	0.013	2.89	3.71	3.53	16.129	6.346	61
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	948.90													44,773			3.582																	
		Flow Carry Over from S.L. "C2"	60.10													1,560		80	0.125																	
		Flow Carry Over from S.L. "C1"	55.10													1,088		80	0.087																	
		TOTAL		1064.10													47421		3.794	2.31	8.767	5	0.237	4.031	9.004	1250	1.330	10.334	36	0.0014	0.013	2.94	3.76	3.53	16.129	5.795	64
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1064.10													47,421			3.794																	
		C3	32.60													628		80	0.050																	
		TOTAL		1096.70													48049		3.844	2.30	8.859	5	0.240	4.084	9.100	1250	1.371	10.471	36	0.0014	0.013	2.98	3.77	3.53	16.129	5.658	65
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1096.70													48,049			3.844																	
		C1B	30.10													800		80	0.064																	
		TOTAL		1126.80													48849		3.908	2.30	8.977	5	0.244	4.152	9.222	1250	1.409	10.630	36	0.0014	0.013	2.97	3.79	3.53	16.129	5.499	66
EX. S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1126.80													48,849			3.908																	
		TOTAL		1126.80													48849		3.908	2.30	8.977	5	0.244	4.152	9.222	1250	1.409	10.630	36	0.0030	0.013	3.97	5.04	5.17	23.610	12.980	45
EX. S.L. "C"		Flow Carry Over	1126.80													48,849			3.908																	

EXISTING EAST KAPOLEI II SEWER CAPACITY COMPUTATIONS

Sewer: **Keahumoa Trunk Sewer**
District:
Reference Maps:

Computed By:
Date:

SEWER LOCATION			TRIBUTARY AREA (acres)		TRIBUTARY EQUIVALENT POPULATION												WASTEWATER FLOW COMPUTATION												SEWER STUDY							
					RESIDENTIAL				COMMERICAL				OTHER				TOTAL											Q_R			n				Q_A		Q_R / Q_A
Point or SMH	Sub-Area Parcel	Land Use	Incr.	Total	Units	Inc. Cap. per unit	Capita	Total	Comm. Floor Area	Flr. Area/ SFPC or Cap./Acre	Capita	Total	Inc. Cap. per area	Capita	Total	Incr. Capita	Total	Avg per Capita Flow (gpcd)	Avg Flow (mgd)	Max Flow Factor	Max Flow (mgd)	Dry I/I Rate (gpcd)	Dry I/I (mgd)	Design Avg Flow (mgd)	Design Max Flow (mgd)	Wet I/I Rate (gad)	Wet I/I (mgd)	Design Peak Flow (mgd)	Pipe Dia. (in)	Pipe Slope	'n' value	AVERAGE FLOW Vel. (fps)	PEAK FLOW Vel. (fps)	FULL FLOW Vel. (fps)	Cap-acity (mgd)	Excess Cap. (mgd)	%
PHASE 2																																				
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over from Ho'opili	1243.00													59,496			4.760																	
		C16	19.70													560		80	0.045																	
		TOTAL		1262.70													60056		4.804	2.20	10.590	5	0.300	5.105	10.891	1250	1.578	12.469	36	0.0013	0.013	3.09	3.80	3.40	15.542	3.073	80
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1262.70													60,056			4.804																	
		C15	2.80													6		80	0.000																	
		Flow Carry Over from S.L. "C4"	101.90													2,512		80	0.201																	
		TOTAL		1367.40													62574		5.006	2.19	10.944	5	0.313	5.319	11.257	1250	1.709	12.966	36	0.0013	0.013	3.12	3.83	3.40	15.542	2.576	83
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1367.40													62,574			5.006																	
		Flow Carry Over from S.L. "C3"	35.80													1,117		80	0.089																	
		TOTAL		1403.20													63691		5.095	2.18	11.100	5	0.318	5.414	11.418	1250	1.754	13.172	36	0.0014	0.013	3.23	3.95	3.53	16.129	2.956	82
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1403.20													63,691			5.095																	
		Flow Carry Over from S.L. "C2"	60.10													1,560		80	0.125																	
		Flow Carry Over from S.L. "C1"	55.10													1,088		80	0.087																	
		TOTAL		1518.40													66339		5.307	2.16	11.468	5	0.332	5.639	11.799	1250	1.898	13.697	36	0.0014	0.013	3.25	3.98	3.53	16.129	2.431	85
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1518.40													66,339			5.307																	
		C3	32.60													628		80	0.050																	
		TOTAL		1551.00													66967		5.357	2.16	11.554	5	0.335	5.692	11.889	1250	1.939	13.828	42	0.0014	0.013	3.25	4.03	3.91	24.329	10.501	57
S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1551.00													66,967			5.357																	
		C1B	30.10													800		80	0.064																	
		TOTAL		1581.10													67767		5.421	2.15	11.665	5	0.339	5.760	12.004	1250	1.976	13.980	42	0.0014	0.013	3.22	4.08	3.91	24.329	10.349	57
EX. S.L. "C" (EAST KAPOLEI II WASTEWATER MP)																																				
		Flow Carry Over	1581.10													67,767			5.421																	
		TOTAL		1581.10													67767		5.421	2.15	11.665	5	0.339	5.760	12.004	1250	1.976	13.980	36	0.0030	0.013	4.29	5.42	5.17	23.610	9.630	59
EX. S.L. "C"		Flow Carry Over	1581.10													67,767			5.421																	

Assumptions

1. The following reports are referenced.
   * "Wastewater Master Plan for East Kapolei", Community Planning and Engineering, Inc., June 2006.
   * "Wastewater Master Plan for East Kapolei II Development", Community Planning and Engineering, Inc., January 2009
   * "Hoopili Sewerage Master Plan", R. M. Towill Corporation, November 6, 2017
2. Kualakai Transit Station TOD Mixed Use to be sewered through Ho'opili
3. Increase in demand assigned to various junctions on Keahumoa Parkway
4. For SL "C", approximately 4,000 LF requires upgrade from 36" to 42" if sewer demands were to follow Table 2.

EXISTING EAST KAPOLEI SEWER CAPACITY COMPUTATIONS (UPSIZE)

Sewer: **Kualakai Trunk Sewer with reduced UHWO Mauka demand**
District:
Reference Maps:

Computed By:
Date:

SEWER LOCATION			TRIBUTARY AREA (acres)		TRIBUTARY EQUIVALENT POPULATION												WASTEWATER FLOW COMPUTATION											SEWER STUDY								
					RESIDENTIAL				COMMERCIAL				OTHER			TOTAL										Q_R			n				Q_A			Q_R / Q_A
Point or SMH	Sub-Area Parcel	Land Use	Incr.	Total	Units	Inc. Cap. per unit	Capita	Total	Comm. Floor Area	Flr. Area/ SFPC or Cap./Acre	Capita	Total	Inc. Cap. per area	Capita	Total	Incr. Capita	Total	Avg per Capita Flow (gpcd)	Avg Flow (mgd)	Max Flow Factor	Max Flow (mgd)	Dry I/I Rate (gpcd)	Dry I/I (mgd)	Design Avg Flow (mgd)	Design Max Flow (mgd)	Wet I/I Rate (gad)	Wet I/I (mgd)	Design Peak Flow (mgd)	Pipe Dia. (in)	Pipe Slope	'n' value	AVERAGE Vel. (fps)	PEAK Vel. (fps)	FULL Vel. (fps)	Cap-acity (mgd)	Excess Cap. (mgd)	Excess %	%
S.L. "A5" (EAST KAPOLEI WASTEWATER MP)																																			
		Flow Carry Over from Mauka	1106.00				5,210							19565		7,600			0.608																	
		DR Horton Gateway Lot	38.10								2,000					2,000		80	0.160																	
		Kualakai Prkwy East & West	92.07													8,535		80	0.683																	
		TOTAL		1236.17													18135		1.451	2.80	4.063	5	0.091	1.541	4.154	1250	1.545	5.699	24	0.0070	0.013	4.24	5.99	6.02	12.232	6.533	53	47
S.L. "A4" (EAST KAPOLEI WASTEWATER MP)																																			
		Flow Carry Over	1236.17													18,135			1.451																	
		TOTAL		1236.17													18135		1.451	2.80	4.063	5	0.091	1.541	4.154	1250	1.545	5.699	30	0.0028	0.013	2.98	4.24	4.42	14.027	8.328	59	41
S.L. "A3" (EAST KAPOLEI WASTEWATER MP)																																			
		Flow Carry Over	1236.17													18,135			1.451																	
		S.L. "D" (less H1)	528.20													30,767		80	2.461																	
		TOTAL		1764.37													48902		3.912	2.30	8.985	5	0.245	4.157	9.230	1250	2.205	11.435	30	0.0028	0.013	3.89	4.94	4.42	14.027	2.592	18	82
S.L. "A2" (EAST KAPOLEI WASTEWATER MP)																																			
		Flow Carry Over	1764.37													48,902			3.912																	
		Transit Station TOD Mixed Use	44.80													4,578		80	0.366																	
		S.L. "C"	1581.10													63,549		80	5.084																	
		TOTAL		3390.27													117029		9.362	1.93	18.059	5	0.585	9.947	18.644	1250	4.238	22.882	42	0.0030	0.013	4.93	6.12	5.73	35.614	12.732	36	64
S.L. "A1" (EAST KAPOLEI WASTEWATER MP)																																			
		Flow Carry Over	3390.27													117,029			9.362																	
		S.L. "B"	92.10													4,010		80	0.321																	
		Central Business	100.00													5,500		80	0.440																	
		TOTAL		3582.37													126539		10.123	1.90	19.224	5	0.633	10.756	19.857	1250	4.478	24.334	42	0.0030	0.013	5.05	6.18	5.73	35.614	11.279	32	68
SECTION A (MAKAKILO INTERCEPTOR REPLACEMENT SEWER)																																			
		Flow Carry Over	3582.37													126,539			10.123																	
		Section B	4842.00													192,386		80	15.391																	
		Reservation For Section A	175.00													750		80	0.060																	
		TOTAL		8599.37													319675		25.574	1.58	40.348	5	1.598	27.172	41.947	1250	10.749	29.253	42	0.0028	0.013	6.14	6.20	5.50	34.221	4.968	15	85
HWWTP		Flow Carry Over	8599.37													319,675			25.574																	

Assumptions

1. The following reports are referenced.
   * "Wastewater Master Plan for East Kapolei", Community Planning and Engineering, Inc., June 2006.
   * "Wastewater Master Plan for East Kapolei II Development", Community Planning and Engineering, Inc., January 2009
   * "Hoopili Sewerage Master Plan", R. M. Towill Corporation, November 6, 2017
2. Use DLNR Preferred Alternative 3 for Kualakai Parkway East & West, and Transit Station TOD Mixed Use
3. Kualakai Parkway Transit Station TOD Mixed Use to be sewered through Ho'opili
4. SL "A1" EP, flow Carry Over from Mauka = 23,550 (UHWO Mauka) + 1,225 (D. R. Horton, formerly Campbell Estate) = 24,775

   If UHWO Mauka EP is reduced by 17,175, -> final EP = 23,550-17,175 =6,375. As a result, SL "A1" EP, flow Carry Over from Mauka = 6,375+1,225 = 7,600.

APPENDIX B

COST ESTIMATES

DLNR East Kapolei Developments, Rough Order-of-Magnitude Cost Estimate Comparison

Items	Alternative 1	Alternative 2	Alternative 3
Sewer (Regional/Project Improvements)			
[1] Kualakai Trunk Sewer Extension (30")	$ 5,789,000	$ 5,789,000	$ 5,789,000
[2] Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36", 700 LF)	$ 924,000	$ 924,000	$ 924,000
[3] Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48", 4,000 LF)	$ 6,240,000	$ 6,240,000	$ 6,240,000
[4] Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42", 4,250 LF)	$ 3,301,000	$ 3,301,000	$ 3,301,000
Subtotal - Sewer (Regional/Project Improvements)	**$ 16,254,000**	**$ 16,254,000**	**$ 16,254,000**
Water (Regional Improvements)			
[5] East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir	$ 7,583,000	$ 7,583,000	$ 7,583,000
Subtotal - Water (Regional Improvements)	**$ 7,583,000**	**$ 7,583,000**	**$ 7,583,000**
DLNR TOD Mixed Use (Regional/Project Improvements)			
Intersections (1 minor inters. at Farrington Hwy)	$ 5,750,000	$ 5,750,000	$ 5,750,000
Regional Drainage (Kaloi Gulch)	$ 1,399,000	$ 1,399,000	$ 1,523,000
DLNR TOD Mixed Use (Project Improvements)			
80' ROW Backbone Road	$ 26,885,000	$ 26,885,000	$ 26,885,000
Onsite Development	$ 21,790,000	$ 21,790,000	$ 21,674,000
Storm Water Quality Treatment	$ 4,370,000	$ 4,370,000	$ 4,140,000
New Water System along Farrington Highway Connecting to Existing 20" Water Main	$ 544,000	$ 544,000	$ 544,000
Non-Potable Water Booster Pump	$ 173,000	$ 173,000	$ 173,000
Subtotal - DLNR TOD Mixed Use	**$ 60,911,000**	**$ 60,911,000**	**$ 60,689,000**
DLNR Kualakai East TMK: 9-1-18: 014 and Kualakai West TMK: 9-1-018: 008 (Regional/Project Improvements)			
Regional Drainage (Kaloi Gulch and Hunehune Gulch)	$ 28,931,000	$ 29,161,000	$ 9,098,000
DLNR Kualakai East TMK: 9-1-018: 014 and Kualakai West TMK: 9-1-018: 008 (Project Improvements)			
Intersections (1 minor inters. at Kualakai Parkway and 1 at Farrington)	$ 11,500,000	$ 11,500,000	$ 11,500,000
60' ROW Backbone Road	$ 13,455,000	$ 13,973,000	$ 13,973,000
Onsite Development	$ 40,642,000	$ 39,797,000	$ 40,413,000
Storm Water Quality Treatment	$ 1,955,000	$ 1,840,000	$ 2,185,000
New 18" Sewer System along Farrington Highway	$ 1,390,000	$ 1,390,000	$ 1,390,000
Non-Potable Water Booster Pump	$ 173,000	$ 173,000	$ 173,000
Connection to Existing Non-Potable Water	$ 230,000	$ 230,000	$ 230,000
Subtotal - DLNR Kualakai East and Kualakai West TMK: 9-1-018: 008	**$ 98,276,000**	**$ 98,064,000**	**$ 78,962,000**

DLNR East Kapolei Developments, Rough Order-of-Magnitude Cost Estimate Comparison

Items	Alternative 1	Alternative 2	Alternative 3
DLNR Kualakai West TMK: 9-1-016: 008 (Project Improvements)			
Intersections (1 minor inters. at Farrington Highway)	$ 5,750,000	$ 5,750,000	$ 5,750,000
60' ROW Backbone Road	$ 5,952,000	$ 5,952,000	$ 5,952,000
Onsite Development	$ 17,261,000	$ 17,261,000	$ 17,261,000
Storm Water Quality Treatment	$ 805,000	$ 805,000	$ 805,000
New 18" Sewer System along Farrington Highway	$ 1,127,000	$ 1,127,000	$ 1,127,000
Non-Potable Water Booster Pump	$ 173,000	$ 173,000	$ 173,000
Subtotal - DLNR Kualakai West TMK: 9-1-016: 008	**$ 31,068,000**	**$ 31,068,000**	**$ 31,068,000**
TOTAL	**$ 214,092,000**	**$ 213,880,000**	**$ 194,556,000**

Notes:

1 Kualakai Trunk Sewer Extension: Improvements cost to be shared by DLNR, UHWO, and D. R. Horton.

2 Kualakai Trunk Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL

3 Kapolei Interceptor Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL.

4 Keahumoa Trunk Sewer Improvements: Improvements cost to be shared by DLNR, D. R. Horton, and DHHL.

5 East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir: Improvements cost to be shared by DLNR and UHWO.

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate Summary

Items	Phase 1 (2020-2029)	Phase 2 (2030-2039)	Phase 3 (2040+)
Sewer (Regional/Project Improvements)			
[1] Kualakai Trunk Sewer Extension (30")		$ 5,789,000	
[2] Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36", 700 LF)			$ 924,000
[3] Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48", 4,000 LF)			$ 6,240,000
[4] Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42", 4,250 LF)		$ 3,301,000	
Subtotal - Sewer (Regional/Project Improvements)	**$ -**	**$ 9,090,000**	**$ 7,164,000**
Water (Regional Improvements)			
[5] East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir			$ 7,583,000
Subtotal - Water (Regional Improvements)	**$ -**	**$ -**	**$ 7,583,000**
DLNR TOD Mixed Use (Regional/Project Improvements)			
Intersections (1 minor inters. at Farrington Hwy)	$ 5,750,000		
Regional Drainage (Kaloi Gulch)	$ 1,399,000		
DLNR-TOD Mixed Use (Project Improvements)			
80' ROW Backbone Road	$ 26,885,000		
Onsite Development	$ 21,790,000		
Storm Water Quality Treatment	$ 4,370,000		
New Water System along Farrington Highway Connecting to Existing 20" Water Main	$ 544,000		
Non-Potable Water Booster Pump	$ 173,000		
Subtotal - DLNR TOD Mixed Use	**$ 60,911,000**	**$ -**	**$ -**
DLNR Kualakai East TMK: 9-1-18: 014 and Kualakai West TMK: 9-1-018: 008 (Regional/Project Improvements)			
Regional Drainage (Kaloi Gulch and Hunehune Gulch)		$ 28,931,000	
DLNR Kualakai East TMK: 9-1-018: 014 and Kualakai West TMK: 9-1-018: 008 (Project Improvements)			
Intersections (1 minor inters. at Kualakai Parkway and 1 at Farrington)		$ 11,500,000	
60' ROW Backbone Road		$ 13,455,000	
Onsite Development		$ 40,642,000	
Storm Water Quality Treatment		$ 1,955,000	
New 18" Sewer System along Farrington Highway		$ 1,390,000	
Non-Potable Water Booster Pump		$ 173,000	
Connection to Existing Non-Potable Water		$ 230,000	
Subtotal - DLNR Kualakai East and Kualakai West TMK: 9-1-018: 008	**$ -**	**$ 98,276,000**	**$ -**

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate Summary

Items	Phase 1 (2020-2029)	Phase 2 (2030-2039)	Phase 3 (2040+)
DLNR Kualakai West TMK: 9-1-016: 008 (Project Improvements)			
Intersections (1 minor inters. at Farrington Highway)			$ 5,750,000
60' ROW Backbone Road			$ 5,952,000
Onsite Development			$ 17,261,000
Storm Water Quality Treatment			$ 805,000
New 18" Sewer System along Farrington Highway			$ 1,127,000
Non-Potable Water Booster Pump			$ 173,000
Subtotal - DLNR Kualakai West TMK: 9-1-016: 008	**$ -**	**$ -**	**$ 31,068,000**
TOTAL	**$ 60,911,000**	**$ 107,366,000**	**$ 45,815,000**
		GRAND TOTAL	**$ 214,092,000**

Notes:

1 Kualakai Trunk Sewer Extension: Improvements cost to be shared by DLNR, UHWO, and D. R. Horton.

2 Kualakai Trunk Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL

3 Kapolei Interceptor Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL.

4 Keahumoa Trunk Sewer Improvements: Improvements cost to be shared by DLNR, D. R. Horton, and DHHL.

5 East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir: Improvements cost to be shared by DLNR and UHWO.

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate Summary

Items	Phase 1 (2020-2029)	Phase 2 (2030-2039)	Phase 3 (2040+)
Sewer (Regional/Project Improvements)			
[1] Kualakai Trunk Sewer Extension (30")		$ 5,789,000	
[2] Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36", 700 LF)			$ 924,000
[3] Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48", 4,000 LF)			$ 6,240,000
[4] Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42", 4,250 LF)		$ 3,301,000	
Subtotal - Sewer (Regional/Project Improvements)	**$ -**	**$ 9,090,000**	**$ 7,164,000**
Water (Regional Improvements)			
[5] East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir			$ 7,583,000
Subtotal - Water (Regional Improvements)	**$ -**	**$ -**	**$ 7,583,000**
DLNR TOD Mixed Use (Regional/Project Improvements)			
Intersections (1 minor inters. at Farrington Hwy)	$ 5,750,000		
Regional Drainage (Kaloi Gulch)	$ 1,399,000		
DLNR-TOD Mixed Use (Project Improvements)			
80' ROW Backbone Road	$ 26,885,000		
Onsite Development	$ 21,790,000		
Storm Water Quality Treatment	$ 4,370,000		
New Water System along Farrington Highway Connecting to Existing 20" Water Main	$ 544,000		
Non-Potable Water Booster Pump	$ 173,000		
Subtotal - DLNR TOD Mixed Use	**$ 60,911,000**	**$ -**	**$ -**
DLNR Kualakai East TMK: 9-1-18: 014 and Kualakai West TMK: 9-1-018: 008 (Regional/Project Improvements)			
Regional Drainage (Kaloi Gulch and Hunehune Gulch)		$ 29,161,000	
DLNR Kualakai East TMK: 9-1-018: 014 and Kualakai West TMK: 9-1-018: 008 (Project Improvements)			
Intersections (1 minor inters. at Kualakai Parkway and 1 at Farrington)		$ 11,500,000	
60' ROW Backbone Road		$ 13,973,000	
Onsite Development		$ 39,797,000	
Storm Water Quality Treatment		$ 1,840,000	
New 18" Sewer System along Farrington Highway		$ 1,390,000	
Non-Potable Water Booster Pump		$ 173,000	
Connection to Existing Non-Potable Water		$ 230,000	
Subtotal - DLNR Kualakai East and Kualakai West TMK: 9-1-018: 008	**$ -**	**$ 98,064,000**	**$ -**

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate Summary

Items	Phase 1 (2020-2029)	Phase 2 (2030-2039)	Phase 3 (2040+)
DLNR Kualakai West TMK: 9-1-016: 008 (Project Improvements)			
Intersections (1 minor inters. at Farrington Highway)			$ 5,750,000
60' ROW Backbone Road			$ 5,952,000
Onsite Development			$ 17,261,000
Storm Water Quality Treatment			$ 805,000
New 18" Sewer System along Farrington Highway			$ 1,127,000
Non-Potable Water Booster Pump			$ 173,000
Subtotal - DLNR Kualakai West TMK: 9-1-016: 008	**$ -**	**$ -**	**$ 31,068,000**
TOTAL	**$ 60,911,000**	**$ 107,154,000**	**$ 45,815,000**
		GRAND TOTAL	**$ 213,880,000**

Notes:

1 Kualakai Trunk Sewer Extension: Improvements cost to be shared by DLNR, UHWO, and D. R. Horton.

2 Kualakai Trunk Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL

3 Kapolei Interceptor Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL.

4 Keahumoa Trunk Sewer Improvements: Improvements cost to be shared by DLNR, D. R. Horton, and DHHL.

5 East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir: Improvements cost to be shared by DLNR and UHWO.

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate Summary

Items	Phase 1 (2020-2029)	Phase 2 (2030-2039)	Phase 3 (2040+)
Sewer (Regional/Project Improvements)			
[1] Kualakai Trunk Sewer Extension (30")		$ 5,789,000	
[2] Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36", 700 LF)			$ 924,000
[3] Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48", 4,000 LF)			$ 6,240,000
[4] Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42", 4,250 LF)		$ 3,301,000	
Subtotal - Sewer (Regional/Project Improvements)	**$ -**	**$ 9,090,000**	**$ 7,164,000**
Water (Regional Improvements)			
[5] East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir			$ 7,583,000
Subtotal - Water (Regional Improvements)	**$ -**	**$ -**	**$ 7,583,000**
DLNR TOD Mixed Use (Regional/Project Improvements)			
Intersections (1 minor inters. at Farrington Hwy)	$ 5,750,000		
Regional Drainage (Kaloi Gulch)	$ 1,523,000		
DLNR-TOD Mixed Use (Project Improvements)			
80' ROW Backbone Road	$ 26,885,000		
Onsite Development	$ 21,674,000		
Storm Water Quality Treatment	$ 4,140,000		
New Water System along Farrington Highway Connecting to Existing 20" Water Main	$ 544,000		
Non-Potable Water Booster Pump	$ 173,000		
Subtotal - DLNR TOD Mixed Use	**$ 60,689,000**	**$ -**	**$ -**
DLNR Kualakai East TMK: 9-1-18: 014 and Kualakai West TMK: 9-1-018: 008 (Regional/Project Improvements)			
Regional Drainage (Kaloi Gulch and Hunehune Gulch)		$ 9,098,000	
DLNR Kualakai East TMK: 9-1-018: 014 and Kualakai West TMK: 9-1-018: 008 (Project Improvements)			
Intersections (1 minor inters. at Kualakai Parkway and 1 at Farrington)		$ 11,500,000	
60' ROW Backbone Road		$ 13,973,000	
Onsite Development		$ 40,413,000	
Storm Water Quality Treatment		$ 2,185,000	
New 18" Sewer System along Farrington Highway		$ 1,390,000	
Non-Potable Water Booster Pump		$ 173,000	
Connection to Existing Non-Potable Water		$ 230,000	
Subtotal - DLNR Kualakai East and Kualakai West TMK: 9-1-018: 008	**$ -**	**$ 78,962,000**	**$ -**

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate Summary

Items	Phase 1 (2020-2029)	Phase 2 (2030-2039)	Phase 3 (2040+)
DLNR Kualakai West TMK: 9-1-016: 008 (Project Improvements)			
Intersections (1 minor inters. at Farrington Highway)			$ 5,750,000
60' ROW Backbone Road			$ 5,952,000
Onsite Development			$ 17,261,000
Storm Water Quality Treatment			$ 805,000
New 18" Sewer System along Farrington Highway			$ 1,127,000
Non-Potable Water Booster Pump			$ 173,000
Subtotal - DLNR Kualakai West TMK: 9-1-016: 008	**$ -**	**$ -**	**$ 31,068,000**
TOTAL	**$ 60,689,000**	**$ 88,052,000**	**$ 45,815,000**
		GRAND TOTAL	**$ 194,556,000**

Notes:

1 Kualakai Trunk Sewer Extension: Improvements cost to be shared by DLNR, UHWO, and D. R. Horton.

2 Kualakai Trunk Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL

3 Kapolei Interceptor Sewer Upgrade: Improvements cost to be shared by DLNR, UHWO, D. R. Horton, and DHHL.

4 Keahumoa Trunk Sewer Improvements: Improvements cost to be shared by DLNR, D. R. Horton, and DHHL.

5 East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir: Improvements cost to be shared by DLNR and UHWO.

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate - Phase 1 (2020 - 2029)
TOD Mixed Use (TMK: 9-1-017: 097)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (80 feet ROW, Road Length = 3,650 feet)						
X			**80' ROW**						
			Sitework	1	LS	LS	$935,130	$140,270	$1,075,000
			Earthwork	1	LS	LS	$2,571,608	$385,741	$2,957,000
			Roadway / Paving	1	LS	LS	$4,675,650	$701,348	$5,377,000
			Potable Water	1	LS	LS	$1,169,783	$175,467	$1,345,000
			Non-Potable Water	1	LS	LS	$935,130	$140,270	$1,075,000
			Sewer	1	LS	LS	$701,348	$105,202	$807,000
			Drainage	1	LS	LS	$7,247,258	$1,087,089	$8,334,000
			Landscape and Irrigation	1	LS	LS	$701,348	$105,202	$807,000
			Electrical	1	LS	LS	$4,441,868	$666,280	$5,108,000
			Subtotal						$26,885,000
X			**Onsite Development**	1	LS	LS	$18,947,812	$2,842,172	$21,790,000
X			**Storm Water Quality Treatment**	1	LS	LS	$3,800,000	$570,000	$4,370,000
		X	**Regional Drainage**						
			Kaloi Gulch Improvements: realignment of gulch and grassed channel with geofabric reinforcing materials	1	LS	LS	$1,216,600	$182,490	$1,399,000
		X	**Intersections (see Note 1)**	1	LS	LS	5,000,000	$750,000	$5,750,000
X			**New Water System along Farrington Highway Connecting to Existing 20" Water Main**						
			Water Line, 16"	800	LF	$591	$472,800	$70,920	$544,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
			Total						$60,911,000

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate - Phase 2 (2030 - 2039)
Kualakai Parkway East (TMK: 9-1-018: 014) and Kualakai Parkway West (TMK: 9-1-018: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (60 feet ROW, Road Length = 2,600 feet)						
X			**60' ROW**						
			Sitework	1	LS	LS	$468,000	$70,200	$538,000
			Earthwork	1	LS	LS	$1,287,000	$193,050	$1,480,000
			Roadway / Paving	1	LS	LS	$2,340,000	$351,000	$2,691,000
			Potable Water	1	LS	LS	$585,000	$87,750	$673,000
			Non-Potable Water	1	LS	LS	$468,000	$70,200	$538,000
			Sewer	1	LS	LS	$351,000	$52,650	$404,000
			Drainage	1	LS	LS	$3,627,000	$544,050	$4,171,000
			Landscape and Irrigation	1	LS	LS	$351,000	$52,650	$404,000
			Electrical	1	LS	LS	$2,223,000	$333,450	$2,556,000
			Subtotal						$13,455,000
X			**Onsite Development**	1	LS	LS	$35,340,489	$5,301,073	$40,642,000
X			**Storm Water Quality Treatment**	1	LS	LS	$1,700,000	$255,000	$1,955,000
		X	**Regional Drainage**						
			New Kaloi Gulch Box Culverts at Farrington Hwy	1	LS	LS	$17,000,000	$2,550,000	$19,550,000
			Kaloi Gulch Culverts at Internal Road	1	LS	LS	$2,630,000	$394,500	$3,025,000
			Kaloi Gulch Improvements: realignment of gulch and grassed channel with geofabric reinforcing materials	1	LS	LS	$3,665,200	$549,780	$4,215,000
			Hunehune Gulch Culverts at Internal Road	1	LS	LS	$657,500	$98,625	$756,000
			Hunehune Gulch Improvements: partial realignment and grassed channel with geofabric reinforcing materials	1	LS	LS	$1,203,930	$180,590	$1,385,000
			Subtotal						$28,931,000
X			**Intersections (see Note 2)**	1	LS	LS	10,000,000	$1,500,000	$11,500,000
		X	**Kualakai Trunk Sewer Extension**						
			Sewer Line, 30"	6,590	LF	$630	$4,151,700	$830,340	$4,982,000
			SMH	19	EA	$35,400	$672,600	$134,520	$807,000
			Subtotal						$5,789,000

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate - Phase 2 (2030 - 2039)
Kualakai Parkway East (TMK: 9-1-018: 014) and Kualakai Parkway West (TMK: 9-1-018: 008)

		X	**New 18" Sewer System along Farrington Highway**						
			Sewer Line, 18"	1,440	LF	$657	$946,080	$189,216	$1,135,000
			SMH	6	EA	$35,400	$212,400	$42,480	$255,000
			Subtotal						$1,390,000
		X	**Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42")**						
			Sewer Line, 42"	4,250	LF	$647	$2,751,025	$550,205	$3,301,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
X			**Connection to Existing Non-Potable Water**	1	LS	LS	200,000	$30,000	$230,000
			Total						$107,366,000

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate - Phase 3 (2040+)
Kualakai Parkway West (TMK: 9-1-016: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (60 feet ROW, Road Length = 1,150 feet)						
X			**60' ROW**						
			Sitework	1	LS	LS	$207,000	$31,050	$238,000
			Earthwork	1	LS	LS	$569,250	$85,388	$655,000
			Roadway / Paving	1	LS	LS	$1,034,130	$155,120	$1,189,000
			Potable Water	1	LS	LS	$258,750	$38,813	$298,000
			Non-Potable Water	1	LS	LS	$207,000	$31,050	$238,000
			Sewer	1	LS	LS	$155,250	$23,288	$179,000
			Drainage	1	LS	LS	$1,604,250	$240,638	$1,845,000
			Landscape and Irrigation	1	LS	LS	$155,250	$23,288	$179,000
			Electrical	1	LS	LS	$983,250	$147,488	$1,131,000
			Subtotal						$5,952,000
X			**Onsite Development**	1	LS	LS	$15,009,958	$2,251,494	$17,261,000
X			**Storm Water Quality Treatment**	1	LS	LS	$700,000	$105,000	$805,000
		X	**Intersections (see Note 3)**	1	LS	LS	5,000,000	$750,000	$5,750,000
X			**New 18" Sewer System along Farrington Highway**						
			Sewer Line, 18"	1,160	LF	$657	$762,120	$152,424	$915,000
			SMH	5	EA	$35,400	$177,000	$35,400	$212,000
			Subtotal						$1,127,000
		X	**Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36")**						
			Sewer Line, 36"	700	LF	$1,100	$770,000	$154,000	$924,000
		X	**Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48")**						
			Sewer Line, 48"	4,000	LF	$1,300	$5,200,000	$1,040,000	$6,240,000

DLNR East Kapolei Developments Alternative 1, Rough Order-of-Magnitude Cost Estimate - Phase 3 (2040+)
Kualakai Parkway West (TMK: 9-1-016: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
	X		**East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir**	1	LS	LS	$7,583,000	N/A	$7,583,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
			Total						$45,815,000

Notes/Assumptions

1 1 major intersection at Farrington Highway
2 1 major intersection at Kualakai Parkway and 1 major intersection at Farrington Highway
3 1 major intersection at Farrington Highway
4 Onsite development costs are the general costs for the ancillary development to support the project.
5 Building, demolition, and soft costs are not included.

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate - Phase 1 (2020 - 2029)
TOD Mixed Use (TMK: 9-1-017: 097)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (80 feet ROW, Road Length = 3,650 feet)						
X			**80' ROW**						
			Sitework	1	LS	LS	$935,130	$140,270	$1,075,000
			Earthwork	1	LS	LS	$2,571,608	$385,741	$2,957,000
			Roadway / Paving	1	LS	LS	$4,675,650	$701,348	$5,377,000
			Potable Water	1	LS	LS	$1,169,783	$175,467	$1,345,000
			Non-Potable Water	1	LS	LS	$935,130	$140,270	$1,075,000
			Sewer	1	LS	LS	$701,348	$105,202	$807,000
			Drainage	1	LS	LS	$7,247,258	$1,087,089	$8,334,000
			Landscape and Irrigation	1	LS	LS	$701,348	$105,202	$807,000
			Electrical	1	LS	LS	$4,441,868	$666,280	$5,108,000
			Subtotal						$26,885,000
X			**Onsite Development**	1	LS	LS	$18,947,812	$2,842,172	$21,790,000
X			**Storm Water Quality Treatment**	1	LS	LS	$3,800,000	$570,000	$4,370,000
		X	**Regional Drainage**						
			Kaloi Gulch Improvements: realignment of gulch and grassed channel with geofabric reinforcing materials	1	LS	LS	$1,216,600	$182,490	$1,399,000
		X	**Intersections (see Note 1)**	1	LS	LS	5,000,000	$750,000	$5,750,000
X			**New Water System along Farrington Highway Connecting to Existing 20" Water Main**						
			Water Line, 16"	800	LF	$591	$472,800	$70,920	$544,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
			Total						$60,911,000

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate - Phase 2 (2030 - 2039)
Kualakai Parkway East (TMK: 9-1-018: 014) and Kualakai Parkway West (TMK: 9-1-018: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (60 feet ROW, Road Length = 2,700 feet)						
X			**60' ROW**						
			Sitework	1	LS	LS	$486,000	$72,900	$559,000
			Earthwork	1	LS	LS	$1,336,500	$200,475	$1,537,000
			Roadway / Paving	1	LS	LS	$2,430,000	$364,500	$2,795,000
			Potable Water	1	LS	LS	$607,500	$91,125	$699,000
			Non-Potable Water	1	LS	LS	$486,000	$72,900	$559,000
			Sewer	1	LS	LS	$364,500	$54,675	$419,000
			Drainage	1	LS	LS	$3,766,500	$564,975	$4,331,000
			Landscape and Irrigation	1	LS	LS	$364,500	$54,675	$419,000
			Electrical	1	LS	LS	$2,308,500	$346,275	$2,655,000
			Subtotal						$13,973,000
X			**Onsite Development**	1	LS	LS	$34,605,741	$5,190,861	$39,797,000
X			**Storm Water Quality Treatment**	1	LS	LS	$1,600,000	$240,000	$1,840,000
		X	**Regional Drainage**						
			New Kaloi Gulch Box Culverts at Farrington Hwy	1	LS	LS	$17,000,000	$2,550,000	$19,550,000
			Kaloi Gulch Culverts at Internal Road	1	LS	LS	$2,630,000	$394,500	$3,025,000
			Kaloi Gulch Improvements: realignment of gulch and grassed channel with geofabric reinforcing materials	1	LS	LS	$3,865,400	$579,810	$4,445,000
			Hunehune Gulch Culverts at Internal Road	1	LS	LS	$657,500	$98,625	$756,000
			Hunehune Gulch Improvements: partial realignment and grassed channel with geofabric reinforcing materials	1	LS	LS	$1,203,930	$180,590	$1,385,000
			Subtotal						$29,161,000
X			**Intersections (see Note 2)**	1	LS	LS	10,000,000	$1,500,000	$11,500,000
		X	**Kualakai Trunk Sewer Extension**						
			Sewer Line, 30"	6,590	LF	$630	$4,151,700	$830,340	$4,982,000
			SMH	19	EA	$35,400	$672,600	$134,520	$807,000
			Subtotal						$5,789,000

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate - Phase 2 (2030 - 2039)
Kualakai Parkway East (TMK: 9-1-018: 014) and Kualakai Parkway West (TMK: 9-1-018: 008)

		X	**New 18" Sewer System along Farrington Highway**						
			Sewer Line, 18"	1,440	LF	$657	$946,080	$189,216	$1,135,000
			SMH	6	EA	$35,400	$212,400	$42,480	$255,000
			Subtotal						$1,390,000
		X	**Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42")**						
			Sewer Line, 42"	4,250	LF	$647	$2,751,025	$550,205	$3,301,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
X			**Connection to Existing Non-Potable Water**	1	LS	LS	200,000	$30,000	$230,000
			Total						$107,154,000

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate - Phase 3 (2040+)
Kualakai Parkway West (TMK: 9-1-016: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (60 feet ROW, Road Length = 1,150 feet)						
X			**60' ROW**						
			Sitework	1	LS	LS	$207,000	$31,050	$238,000
			Earthwork	1	LS	LS	$569,250	$85,388	$655,000
			Roadway / Paving	1	LS	LS	$1,034,130	$155,120	$1,189,000
			Potable Water	1	LS	LS	$258,750	$38,813	$298,000
			Non-Potable Water	1	LS	LS	$207,000	$31,050	$238,000
			Sewer	1	LS	LS	$155,250	$23,288	$179,000
			Drainage	1	LS	LS	$1,604,250	$240,638	$1,845,000
			Landscape and Irrigation	1	LS	LS	$155,250	$23,288	$179,000
			Electrical	1	LS	LS	$983,250	$147,488	$1,131,000
			Subtotal						$5,952,000
X			**Onsite Development**	1	LS	LS	$15,009,958	$2,251,494	$17,261,000
X			**Storm Water Quality Treatment**	1	LS	LS	$700,000	$105,000	$805,000
		X	**Intersections (see Note 3)**	1	LS	LS	5,000,000	$750,000	$5,750,000
X			**New 18" Sewer System along Farrington Highway**						
			Sewer Line, 18"	1,160	LF	$657	$762,120	$152,424	$915,000
			SMH	5	EA	$35,400	$177,000	$35,400	$212,000
			Subtotal						$1,127,000
		X	**Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36")**						
			Sewer Line, 36"	700	LF	$1,100	$770,000	$154,000	$924,000
		X	**Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48")**						
			Sewer Line, 48"	4,000	LF	$1,300	$5,200,000	$1,040,000	$6,240,000

DLNR East Kapolei Developments Alternative 2, Rough Order-of-Magnitude Cost Estimate - Phase 3 (2040+)
Kualakai Parkway West (TMK: 9-1-016: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
	X		**East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir**	1	LS	LS	$7,583,000	N/A	$7,583,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
			Total						$45,815,000

Notes/Assumptions

1 1 major intersection at Farrington Highway
2 1 major intersection at Kualakai Parkway and 1 major intersection at Farrington Highway
3 1 major intersection at Farrington Highway
4 Onsite development costs are the general costs for the ancillary development to support the project.
5 Building, demolition, and soft costs are not included.

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate - Phase 1 (2020 - 2029)
TOD Mixed Use (TMK: 9-1-017: 097)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (80 feet ROW, Road Length = 3,650 feet)						
X			**80' ROW**						
			Sitework	1	LS	LS	$935,130	$140,270	$1,075,000
			Earthwork	1	LS	LS	$2,571,608	$385,741	$2,957,000
			Roadway / Paving	1	LS	LS	$4,675,650	$701,348	$5,377,000
			Potable Water	1	LS	LS	$1,169,783	$175,467	$1,345,000
			Non-Potable Water	1	LS	LS	$935,130	$140,270	$1,075,000
			Sewer	1	LS	LS	$701,348	$105,202	$807,000
			Drainage	1	LS	LS	$7,247,258	$1,087,089	$8,334,000
			Landscape and Irrigation	1	LS	LS	$701,348	$105,202	$807,000
			Electrical	1	LS	LS	$4,441,868	$666,280	$5,108,000
			Subtotal						$26,885,000
X			**Onsite Development**	1	LS	LS	$18,846,916	$2,827,037	$21,674,000
X			**Storm Water Quality Treatment**	1	LS	LS	$3,600,000	$540,000	$4,140,000
		X	**Regional Drainage**						
			Kaloi Gulch Improvements: along existing alignment and grassed channel with geofabric reinforcing materials	1	LS	LS	$1,324,400	$198,660	$1,523,000
		X	**Intersections (see Note 1)**	1	LS	LS	5,000,000	$750,000	$5,750,000
X			**New Water System along Farrington Highway Connecting to Existing 20" Water Main**						
			Water Line, 16"	800	LF	$591	$472,800	$70,920	$544,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
			Total						$60,689,000

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate - Phase 2 (2030 - 2039)
Kualakai Parkway East (TMK: 9-1-018: 014) and Kualakai Parkway West (TMK: 9-1-018: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (60 feet ROW, Road Length = 2,700 feet)						
X			**60' ROW**						
			Sitework	1	LS	LS	$486,000	$72,900	$559,000
			Earthwork	1	LS	LS	$1,336,500	$200,475	$1,537,000
			Roadway / Paving	1	LS	LS	$2,430,000	$364,500	$2,795,000
			Potable Water	1	LS	LS	$607,500	$91,125	$699,000
			Non-Potable Water	1	LS	LS	$486,000	$72,900	$559,000
			Sewer	1	LS	LS	$364,500	$54,675	$419,000
			Drainage	1	LS	LS	$3,766,500	$564,975	$4,331,000
			Landscape and Irrigation	1	LS	LS	$364,500	$54,675	$419,000
			Electrical	1	LS	LS	$2,308,500	$346,275	$2,655,000
			Subtotal						$13,973,000
X			**Onsite Development**	1	LS	LS	$35,142,141	$5,271,321	$40,413,000
X			**Storm Water Quality Treatment**	1	LS	LS	$1,900,000	$285,000	$2,185,000
		X	**Regional Drainage**						
			Kaloi Gulch Culverts at Internal Road	1	LS	LS	$2,630,000	$394,500	$3,025,000
			Kaloi Gulch Improvements: along existing alignment and grassed channel with geofabric reinforcing materials	1	LS	LS	$3,418,800	$512,820	$3,932,000
			Hunehune Gulch Culverts at Internal Road	1	LS	LS	$657,500	$98,625	$756,000
			Hunehune Gulch Improvements: partial realignment and grassed channel with geofabric reinforcing materials	1	LS	LS	$1,203,930	$180,590	$1,385,000
			Subtotal						$9,098,000
X			**Intersections (see Note 2)**	1	LS	LS	10,000,000	$1,500,000	$11,500,000
		X	**Kualakai Trunk Sewer Extension**						
			Sewer Line, 30"	6,590	LF	$630	$4,151,700	$830,340	$4,982,000
			SMH	19	EA	$35,400	$672,600	$134,520	$807,000
			Subtotal						$5,789,000

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate - Phase 2 (2030 - 2039)
Kualakai Parkway East (TMK: 9-1-018: 014) and Kualakai Parkway West (TMK: 9-1-018: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
X			**New 18" Sewer System along Farrington Highway**						
			Sewer Line, 18"	1,440	LF	$657	$946,080	$189,216	$1,135,000
			SMH	6	EA	$35,400	$212,400	$42,480	$255,000
			Subtotal						$1,390,000
		X	**Keahumoa Trunk Sewer Improvements (Upsize Existing Sewer from 36" to 42")**						
			Sewer Line, 42"	4,250	LF	$647	$2,751,025	$550,205	$3,301,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
X			**Connection to Existing Non-Potable Water**	1	LS	LS	200,000	$30,000	$230,000
			Total						$88,052,000

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate - Phase 3 (2040+)
Kualakai Parkway West (TMK: 9-1-016: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
			Backbone Road (60 feet ROW, Road Length = 1,150 feet)						
X			**60' ROW**						
			Sitework	1	LS	LS	$207,000	$31,050	$238,000
			Earthwork	1	LS	LS	$569,250	$85,388	$655,000
			Roadway / Paving	1	LS	LS	$1,034,130	$155,120	$1,189,000
			Potable Water	1	LS	LS	$258,750	$38,813	$298,000
			Non-Potable Water	1	LS	LS	$207,000	$31,050	$238,000
			Sewer	1	LS	LS	$155,250	$23,288	$179,000
			Drainage	1	LS	LS	$1,604,250	$240,638	$1,845,000
			Landscape and Irrigation	1	LS	LS	$155,250	$23,288	$179,000
			Electrical	1	LS	LS	$983,250	$147,488	$1,131,000
			Subtotal						$5,952,000
X			**Onsite Development**	1	LS	LS	$15,009,958	$2,251,494	$17,261,000
X			**Storm Water Quality Treatment**	1	LS	LS	$700,000	$105,000	$805,000
		X	**Intersections (see Note 3)**	1	LS	LS	5,000,000	$750,000	$5,750,000
X			**New 18" Sewer System along Farrington Highway**						
			Sewer Line, 18"	1,160	LF	$657	$762,120	$152,424	$915,000
			SMH	5	EA	$35,400	$177,000	$35,400	$212,000
			Subtotal						$1,127,000
		X	**Kualakai Trunk Sewer Upgrade (Upsize Existing Sewer from 30" to 36")**						
			Sewer Line, 36"	700	LF	$1,100	$770,000	$154,000	$924,000
		X	**Kapolei Interceptor Sewer Upgrade (Upsize Existing Sewer from 42" to 48")**						
			Sewer Line, 48"	4,000	LF	$1,300	$5,200,000	$1,040,000	$6,240,000

DLNR East Kapolei Developments Alternative 3, Rough Order-of-Magnitude Cost Estimate - Phase 3 (2040+)
Kualakai Parkway West (TMK: 9-1-016: 008)

Project Impr.	Regional Impr.	Regional/Project Impr.		Quantity	Unit	Unit Cost on Year 2019	Subtotal Cost on Year 2019	Contingency (15%)	Total Cost on Year 2019
	X		**East Kapolei 440-Foot System, 2.5 MG Potable Water Reservoir**	1	LS	LS	$7,583,000	N/A	$7,583,000
X			**Non-Potable Water Booster Pump**	1	LS	LS	150,000	$22,500	$173,000
			Total						$45,815,000

Notes/Assumptions

1 1 major intersection at Farrington Highway
2 1 major intersection at Kualakai Parkway and 1 major intersection at Farrington Highway
3 1 major intersection at Farrington Highway
4 Onsite development costs are the general costs for the ancillary development to support the project.
5 Building, demolition, and soft costs are not included.

Appendix E

Economic Impact Analysis

DLNR East Kapolei Lands Economic Impact Analysis

Prepared for:

RM Towill

Prepared by:

COLLIERS INTERNATIONAL HAWAII
220 S. King Street
Suite 1800
Honolulu, HI 96813
808.524.2666

February 18, 2020

LIMITING CONDITIONS

The research undertaken in our report and which underpins the estimates of future performance of the project are prepared in accordance with industry practice. Colliers Hawaii Research & Consulting ("Colliers") undertakes steps to determine whether the Client's assumptions underlying the estimates included in our report are fair and reasonable in the light of information provided and available. In our experience, these assumptions will have to be reviewed and revised by the Client periodically to reflect changes in the underlying market trends, trading patterns and the competitive environment.

Accordingly, we can offer no guarantees or warranties (expressed or implied) that the assumptions and resulting estimates set out in our report will be achieved. Our report identifies these hypothetical events or assumptions and any limitations to the usefulness of the presentation. Even if the hypothetical assumptions were to occur, there will usually be differences between the projected and actual results because events and circumstances frequently do not occur as expected, and the differences may by material.

The Client is responsible for representations about its plans, expectations, final assumptions to be used in the model and for disclosure of significant information that might affect the ultimate realization of the projected results. Our findings constitute only one of several factors for the Client to consider in its decision-making process. The ultimate decision to move forward with the project rests with the project's management team.

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SCOPE OF WORK

Colliers International Hawaii ("Colliers") was engaged by RM Towill Corporation to conduct an economic impact analysis for development of the residential, commercial, industrial and hotel uses on the DLNR East Kapolei lands.

Our study provided the following:

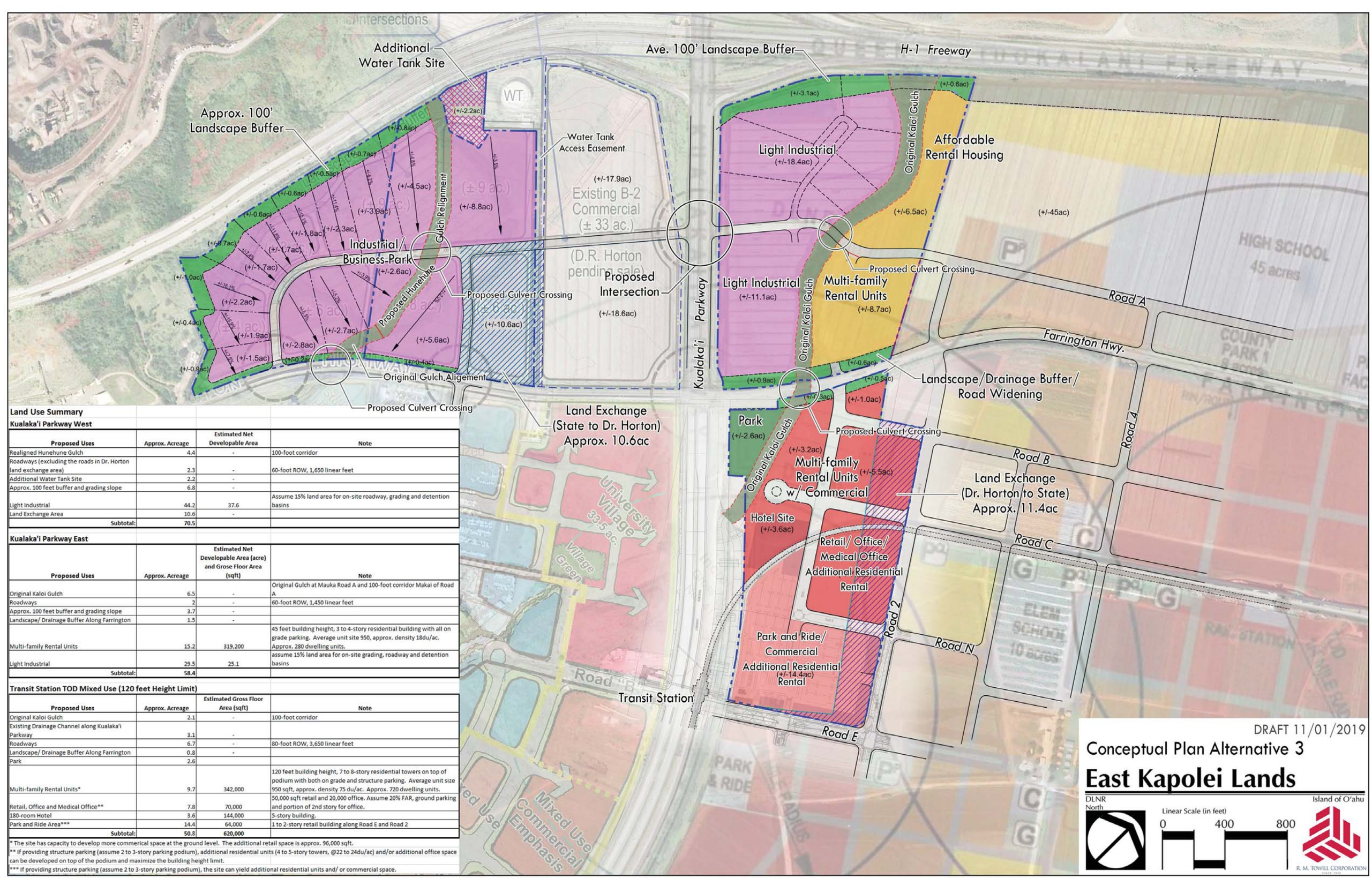
- Econometric Model Creation (model depicts the flow of capital, job creation (during construction and stabilized operations), probable number of patrons, on and off-site expenditures of workers and patrons)
- Identification of Secondary Impacts and Their Influence on Economic Returns
- Forecasts for Tax Revenues (project vs. public costs/services)

The DLNR East Kapolei lands consist of three areas of land along Kualaka'I Parkway and Farrington Highway totaling approximately 179.6 acres. A summary of the land uses, market demand study findings, and property measures used for the economic impact analysis are provided on the next page followed by the Conceptual Plan (Alternative 3) dated November 1, 2019.

DLNR EAST KAPOLEI LANDS CONCEPTUAL PLAN SUMMARY						
	Developable Area/Gross Floor Area				Potential Market Demand by 2039 (1)	Economic Impact Analysis (2) (2020 - 2039)
	Kualaka'I Parkway West (70.5 acres)	**Kualaka'I Parkway East (58.4 acres)**	**TOD Mixed Use (50.7 acres)**	**Notes**		
Multi-family Rental		266,000 sf 280 units	684,000 sf 720 units	3 -to 4-story building & 7- to 8-story building Avg unit size: 950 sf	2,110 units	1,000 units
Retail			50,000 sf 64,000 sf	2 - story with upstairs office space 1- or 2-story in Park & Ride Area	120,000 sf - 168,000 sf	114,000 sf
Office			20,000 sf	Upstairs office	16,000 sf - 24,000 sf	20,000 sf
Industrial	37.6 acres	25.1 acres		Est. building area: 1.04 million sf	24 acres - 48 acres	48 acres
Hotel			144,000 sf 180 rooms	5-story building	180 rooms	180 rooms

(1) Conservative to aggressive range(rounded) from Market Demand Studies (February 2020). There may be additional demand beyond 2039.

(2) There may be additional demand beyond 2039 but that analysis was beyond the scope of this study.



Land Use Summary

Kualaka'i Parkway West

Proposed Uses	Approx. Acreage	Estimated Net Developable Area	Note
Realigned Hunehune Gulch	4.4	-	100-foot corridor
Roadways (excluding the roads in Dr. Horton land exchange area)	2.3	-	60-foot ROW, 1,650 linear feet
Additional Water Tank Site	2.2	-	
Approx. 100 feet buffer and grading slope	6.8	-	
Light Industrial	44.2	37.6	Assume 15% land area for on-site roadway, grading and detention basins
Land Exchange Area	10.6	-	
Subtotal:	**70.5**		

Kualaka'i Parkway East

Proposed Uses	Approx. Acreage	Estimated Net Developable Area (acre) and Grose Floor Area (sqft)	Note
Original Kaloi Gulch	6.5	-	Original Gulch at Mauka Road A and 100-foot corridor Makai of Road A
Roadways	2	-	60-foot ROW, 1,450 linear feet
Approx. 100 feet buffer and grading slope	3.7	-	
Landscape/ Drainage Buffer Along Farrington	1.5	-	
Multi-family Rental Units	15.2	319,200	45 feet building height, 3 to 4-story residential building with all on grade parking. Average unit site 950, approx. density 18du/ac. Approx. 280 dwelling units.
Light Industrial	29.5	25.1	assume 15% land area for on-site grading, roadway and detention basins
Subtotal:	**58.4**		

Transit Station TOD Mixed Use (120 feet Height Limit)

Proposed Uses	Approx. Acreage	Estimated Gross Floor Area (sqft)	Note
Original Kaloi Gulch	2.1	-	100-foot corridor
Existing Drainage Channel along Kualaka'i Parkway	3.1	-	
Roadways	6.7	-	80-foot ROW, 3,650 linear feet
Landscape/ Drainage Buffer Along Farrington	0.8	-	
Park	2.6		
Multi-family Rental Units*	9.7	342,000	120 feet building height, 7 to 8-story residential towers on top of podium with both on grade and structure parking. Average unit size 950 sqft, approx. density 75 du/ac. Approx. 720 dwelling units.
Retail, Office and Medical Office**	7.8	70,000	50,000 sqft retail and 20,000 office. Assume 20% FAR, ground parking and portion of 2nd story for office.
180-room Hotel	3.6	144,000	5-story building.
Park and Ride Area***	14.4	64,000	1 to 2-story retail building along Road E and Road 2
Subtotal:	**50.8**	**620,000**	

* The site has capacity to develop more commerical space at the ground level. The additional retail space is approx. 96,000 sqft.

** If providing structure parking (assume 2 to 3-story parking podium), additional residential units (4 to 5-story towers, @22 to 24du/ac) and/or additional office space can be developed on top of the podium and maximize the building height limit.

*** If providing structure parking (assume 2 to 3-story parking podium), the site can yield additional residential units and/ or commercial space.

METHODOLOGY

The purpose of this analysis is to estimate the major economic contributions that development of apartments, retail centers, office buildings, industrial buildings and hotels on the DLNR East Kapolei Lands would bring to Hawaii. An economic impact analysis was performed for each of the individual proposed land uses.

Market Demand Study Findings

The basis of this analysis were findings from the market demand studies performed by Colliers International for each property type and the supported conceptual plan. This includes estimates on supportable leasable area (square feet), average rents and operating expenses, average occupancy rates, retail spending, and development timeline.

Input-Output Study

The economic impacts from developing the various land uses were formulated based on data from the input-output tables in the State of Hawaii's Department of Business, Economic Development & Tourism's Hawaii State Input- Output Study (2012). For this analysis, the multipliers from the I-O tables form the basis for estimating output, income, and employment.

Timing

The analysis examines a 20-year timeframe from January 1, 2020 through December 31, 2039. All findings stem from a baseline 2019 value. For the year-by-year summary, values are inflated by 3.0% annually.

Economic Impacts

Economic growth from development on the DLNR East Kapolei Lands will occur from the development of buildings and the operations of these buildings. The construction impact is temporary as it only occurs during the development periods. A permanent impact from building tenants and operations is projected once the buildings are constructed and occupied.

<u>Construction</u>

- Construction Costs - Direct Output and Indirect & Induced
- Employment & Wages - Direct Output and Indirect & Induced FTEs and Income
- Tax Revenues – GET and Income Taxes from Direct Output

<u>Operations</u>

- New Consumer Spending (retail) - Direct Output and Indirect & Induced
- Building Operating Costs - Direct Output and Indirect & Induced
- Employment & Wages - Direct Output and Indirect & Induced FTEs and Income
- Tax Revenues – GET, TAT and Income Taxes from Direct Output

SUMMARY OF FINDINGS – CONSTRUCTION IMPACT

The table below summarizes the total economic output from construction of all development on the DLNR East Kapolei Lands for each five-year period from 2020 to 2039.

Total Construction Economic Impact ($2019, rounded) for 2020 to 2039 – Direct & Secondary Impacts

- Output $2.83 billion
- Employment FTEs 5,104
- Employment Wages $603.4million
- Fiscal $28.1 million

TOTAL CONSTRUCTION ECONOMIC IMPACT					
Period	**2020 -2024**	**2025 - 2029**	**2030 - 2034**	**2035 - 2039**	**Total**
OUTPUT ($2019, 000s)					
Construction Costs	$ 332,543	$ 226,487	$ 220,866	$ 132,312	**$ 912,209**
Indirect & Induced	$ 698,252	$ 475,563	$ 463,761	$ 277,820	**$ 1,915,395**
Total	$ 1,030,795	$ 702,050	$ 684,627	$ 410,132	**$ 2,827,604**
EMPLOYMENT & WAGES ($2019, 000s)					
Construction FTEs	1,057	523	1,057	863	**3,501**
Indirect & Induced FTEs	577	249	465	312	**1,603**
Total	1,634	772	1,522	1,175	**5,104**
Construction Wages	$ 72,669	$ 29,999	$ 65,979	$ 43,494	**$ 212,140**
Indirect & Induced	$ 134,024	$ 55,327	$ 121,685	$ 80,217	**$ 391,254**
Total	$ 206,692	$ 85,326	$ 187,664	$ 123,711	**$ 603,394**
FISCAL ($2019, 000s)					
GET	$ 1,663	$ 1,132	$ 1,104	$ 662	**$ 4,561**
Income Taxes (1)	$ 9,311	$ 6,342	$ 4,406	$ 3,463	**$ 23,521**
Total	$ 10,974	$ 7,474	$ 5,510	$ 4,124	**$ 28,082**

CONSTRUCTION IMPACT BY LAND USE

The table below separates the total economic output by land use over the 20-year period from 2020 to 2039.

TOTAL CONSTRUCTION ECONOMIC IMPACT						
Land Use	Multi-Family	Retail	Office	Industrial	Hotel	Total
OUTPUT ($2019 000s)						
Construction Costs	$ 503,392	$ 39,338	$ 16,041	$ 257,643	$ 95,794	**$ 912,209**
Indirect & Induced	$ 1,056,989	$ 82,600	$ 33,681	$ 540,982	$ 201,143	**$ 1,915,395**
Total	$ 1,560,381	$ 121,938	$ 49,722	$ 798,626	$ 296,937	**$ 2,827,604**
% of Total	55%	4%	2%	28%	11%	100%
EMPLOYMENT & WAGES ($2019, 000s)						
Construction FTEs	1,269	242	38	1,690	262	**3,501**
Indirect & Induced FTEs	692	130	20	621	140	**1,603**
Total	1,961	372	58	2,311	402	**5,104**
Construction Wages	$ 87,188	$ 26,654	$ 2,600	$ 71,683	$ 24,016	**212,140**
Indirect & Induced	$ 160,801	$ 49,152	$ 4,800	$ 132,206	$ 44,295	**391,255**
Total	$ 247,989	$ 75,806	$ 7,400	$ 203,888	$ 68,311	**$ 535,084**
FISCAL ($2019, 000s)						
GET	$ 2,517	$ 197	$ 80	$ 1,288	$ 479	**$ 4,561**
Income Taxes (1)	$ 14,095	$ 1,101	$ 207	$ 7,214	$ 904	**$ 23,521**
Total	$ 16,612	$ 1,298	$ 287	$ 8,502	$ 1,383	**$ 28,082**

SUMMARY OF FINDINGS – OPERATIONS IMPACT

The table below summarizes the total economic output from the operations of the new buildings on the DLNR East Kapolei Lands for each five-year period from 2020 to 2039. Unlike the construction impact, the operations economic impact is permanent and increases as the properties are developed and occupied.

Total Operations Economic Impact ($2019 rounded) – Direct & Secondary Impacts

- Output $1.6 billion annually
- Employment FTEs 2,390
- Employment Wages $1.81 billion annually
- Fiscal $126.6 million annually

Period	2020 -2024	2025 - 2029	2030 - 2034	2035 - 2039	Total
OUTPUT ($2019 000s)					
Retail Spending	$ -	$ -	$ 75,464	$ 153,127	**$ 228,591**
Induced & Indirect	$ -	$ -	$ 141,234	$ 329,639	**$ 470,873**
Total	$ -	$ -	$ 216,698	$ 482,766	**$ 699,464**
Building Operations	$ 5,940	$ 36,003	$ 105,891	$ 147,061	**$ 294,895**
Induced & Indirect	$ 12,153	$ 73,713	$ 217,107	$ 304,576	**$ 607,550**
Total	$ 18,094	$ 109,715	$ 322,999	$ 451,637	**$ 902,445**
TOTAL OUTPUT	$ 18,094	$ 109,715	$ 539,697	$ 934,403	**$ 1,601,909**
EMPLOYMENT & WAGES ($2019, 000s)					
Building Tenants FTEs	-	331	1,298	2,196	**2,196**
Building Operations FTEs	7	10	109	118	**118**
Indirect & Induced FTES	13	17	54	76	**76**
Total	20	358	1,462	2,390	**2,390**
Building Tenant wages	$ -	$ 35,766	$ 409,653	$ 899,336	**$ 1,344,754**
Building Operations	$ 381	$ 2,256	$ 100,494	$ 219,001	**$ 322,133**
Indirect & Induced Wages	$ 681	$ 4,029	$ 52,861	$ 88,552	**$ 146,123**
Total	$ 1,062	$ 42,051	$ 563,008	$ 1,206,889	**$ 1,813,010**
FISCAL ($2019, 000s)					
GET	$ 622	$ 3,895	$ 20,951	$ 33,748	**$ 59,215**
Property Taxes	$ 1,374	$ 8,798	$ 22,419	$ 34,789	**$ 67,381**
Income Taxes (1)	$ 127	$ 1,988	$ 15,196	$ 32,363	**$ 49,673**
Total	$ 1,996	$ 12,693	$ 43,370	$ 68,537	**$ 126,596**
(1) Direct output FTEs					

OPERATIONS IMPACT BY LAND USE

The table below separates the total economic output by land use over the 20-year period from 2020 to 2039.

TOTAL OPERATIONS ECONOMIC IMPACT						
Land Use	Multi-Family	Retail	Office	Industrial	Hotel	Total
OUTPUT ($2019 000s)						
Retail Spending	$ -	$ 228,591	$ -	$ -	$ -	**$ 228,591**
Induced & Indirect	$ -	$ 470,873	$ -	$ -	$ -	**$ 470,873**
Total	$ -	$ 699,464	$ -	$ -	$ -	**$ 699,464**
Building Operations	$ 154,034	$ 17,508	$ 1,255	$ 23,147	$ 98,951	**$ 294,895**
Induced & Indirect	$ 315,152	$ 38,636	$ 2,530	$ 48,779	$ 202,453	**$ 607,550**
Total	$ 469,186	$ 56,144	$ 3,785	$ 71,926	$ 301,404	**$ 902,445**
TOTAL OUTPUT	$ 469,186	$ 755,608	$ 3,785	$ 71,926	$ 301,404	**$ 1,601,909**
EMPLOYMENT & WAGES ($2019, 000s)						
Building Tenants FTEs	-	251	127	1,818	-	**2,196**
Building Operations FTEs	10	18	-	-	90	**118**
Indirect & Induced FTES	17	42	-	-	16	**76**
Total	27	311	127	1,818	106	**2,390**
Building Tenant wages	$ -	$ 255,381	$ 49,411	$ 1,089,373	$ -	**$ 1,394,165**
Building Operations	$ 9,884	$ 12,858	$ -	$ -	$ 5,839	**$ 28,581**
Indirect & Induced Wages	$ 17,651	$ 14,142	$ -	$ -	$ 12,115	**$ 43,909**
Total	$ 27,535	$ 282,381	$ 49,411	$ 1,089,373	$ 17,954	**$1,466,655**
FISCAL ($2019, 000s)						
GET/TAT	$ 14,360	$ 17,366	$ 216	$ 9,684	$ 17,589	**$ 59,215**
Property Taxes	$ 35,634	$ 7,523	$ 732	$ 18,273	$ 5,219	**$ 67,381**
Income Taxes (1)	$ 3,288	$ 3,855	$ 1,709	$ 37,681	$ 3,140	**$ 49,673**
Total	$ 49,994	$ 24,889	$ 948	$ 27,957	$ 25,947	**$ 176,269**
(1) Direct output FTEs						

DEVELOPMENT OVERVIEW

Our analysis was based on the conceptual plan shown on page 5. Not all of the proposed development is accounted for under this analysis as our assumptions were based on the market demand studies provided for a 20-year demand period. A timeline of the delivery of the buildings for each land use (also based on the market demand studies) is provided after the conceptual plan.

DLNR EAST KAPOLEI LANDS ECONOMIC IMPACT																					
ANALYSIS DELIVERY TIMELINE																					
YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TOTAL
MULTI FAMILY RESIDENTIAL RENTAL																					
Number of Units	*0*	*0*	*0*	*0*	***720***	*0*	*0*	*0*	*0*	*280*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1,000*
RETAIL																					
Buildings (sf)	*0*	*0*	*0*	*0*	***0***	*0*	*0*	*0*	*0*	*0*	*0*	*64,000*	*0*	*0*	*0*	*0*	*50,000*	*0*	*0*	*0*	*114,000*
OFFICE																					
Buildings (sf)	*0*	*0*	*0*	*0*	***0***	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*20,000*	*0*	*0*	*0*	*20,000*
INDUSTRIAL																					
Acres Absorbed/Leased	*0*	*0*	*0*	*0*	***0***	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*0.0*	*4.0*	*4.0*	*4.0*	*0*	*0*	*48.0*
Buildings (sf)								*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*-*	*87,120*	*87,120*	*87,120*	*1,045,440*
HOTEL																					
Number of Rooms	*0*	*0*	*0*	*0*	***0***	*0*	*0*	*0*	*0*	*0*	*0*	*180*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*180*

ECONOMIC IMPACT ANALYSIS

The purpose of this analysis is to estimate the major economic contributions that development of apartments, retail centers, office buildings, industrial buildings and hotels on the DLNR East Kapolei Lands would bring to Hawaii. The basis of this analysis were findings from the market demand studies performed by Colliers International for each property type and the supported conceptual plan. This includes estimates on supportable leasable area (square feet), average rents and operating expenses, average occupancy rates, retail spending, and so on.

INPUT-OUTPUT STUDY

The economic impacts were formulated based on data from the input-output tables in the State of Hawaii's Department of Business, Economic Development & Tourism's Hawaii State Input- Output Study (2012).

An input-output (I-O) model depicts a comprehensive and detailed set of accounts of sales and purchases of goods and services among the producing industries, final consumers (households, visitors, exports, and government), and resource owners (labor, capital, and land) during a particular time period (usually a year) for a specific economy or region. For this analysis, the I-O tables form the factual basis for estimating output, income, employment, and other multipliers (for 68 industry sectors), which are frequently used in economic impact analyses.

DEFINITION OF KEY TERMS

The projected results are segregated into impacts that are "direct," "indirect," and "induced." These impacts are summarized below:

- **Direct impacts** represent impacts typically attributed directly to expenditure of money by, or on behalf of, consumers. Examples include the expenditures for dining out, sports and recreational activities, retail spending, transportation and the like. These type of impacts are relevant for a hotel and retail development. In addition, capital expenditures for construction or the employment of any person in the operation of a retail, industrial, office, hotel, or apartment property is considered a direct impact.

- **Indirect impacts** consider a "supplier" relationship exists between each industry and numerous other economic sectors in the region. For instance, the operator of a hotel, retail, office, industrial, or apartment property may purchase goods or services from other supporting businesses such as industry vendors, professional services firms, visitor activity firms, advertising companies, furniture stores, etc.

- **Induced impacts** represent the re-spending of earned income throughout the State's economy by employees or proprietors of businesses that benefit from direct or indirect expenditures. For example, an employee at a retail center may spend his earnings to purchase groceries, dine out, see a movie, purchase a car, etc.

- **Fiscal impacts** are the tax revenues to the State and County from expenditures and earnings. These include General Excise Taxes ("GET") and income taxes, as well as real property taxes.

ASSUMPTIONS

Construction Impact

Hard Costs - Construction costs can be separated into hard costs and soft costs. Hard costs can be related to the building's structure, the site and to the landscape. All labor and materials required for construction are included in hard costs. Examples include utilities, life safety systems and equipment, HVAC systems, paving, grading etc., as well as landscape expenses including grass, trees, mulch, fertilizer, and so on. We assumed material costs were 65% of totals costs and labor was 35%. We utilized general market benchmarks for hard costs for each property type.

Soft Costs - Soft costs are any costs that are not considered direct construction costs. Soft costs include everything from architectural and engineering fees, to legal fees, pre- and post-construction expenses, permits and taxes, insurance, etc. The soft costs assumption is projected to be 20% of the total hard costs.

Operational Impact

Once the land is developed, there would be a permanent increase in economic activity and jobs.

Building Revenue (In-flow of funds) – While business revenue is an economic stimulant, it is difficult to reasonably project for the businesses occupying the future buildings on the DLNR East Kapolei lands. Unlike business revenue, rental revenue from building operations is something that can be projected based on current market data. For each building type, we projected the annual rental revenue using a current market rent and occupancy rate. This number was inflated 3.0% annually (market benchmark) to project future revenues. The economic impact measured is the spending/expenditure flow of this revenue.

Building Operating Expenses (expenditure flow) – Another source of economic impact is from the expenses needed to operate the commercial and residential properties. Direct expenditures include utilities, maintenance and repair, professional services, and finance and insurance. It should be noted that not all vendors or service providers are in Hawaii. Thus, the economic impact may be overstated and not all of the expenditures translate to revenues for Hawaii businesses.

Fiscal Impact

General Excise Tax ("GET") – The GET (4.712%) on direct expenditures/new spending from construction and building operations was estimated as a fiscal impact.

Income Taxes – Another source of tax revenue for the State is the income taxes from the construction and operational employees.

Real Property Taxes – To estimate real property taxes, we applied the relevant tax rate (residential, commercial, industrial, hotel and resort) for Honolulu County to the construction cost value.

Transient Accommodations Tax ("TAT") – The TAT was estimated for the hotel uses on the subject lands. The current rate of 10.25% was applied to gross room revenues.

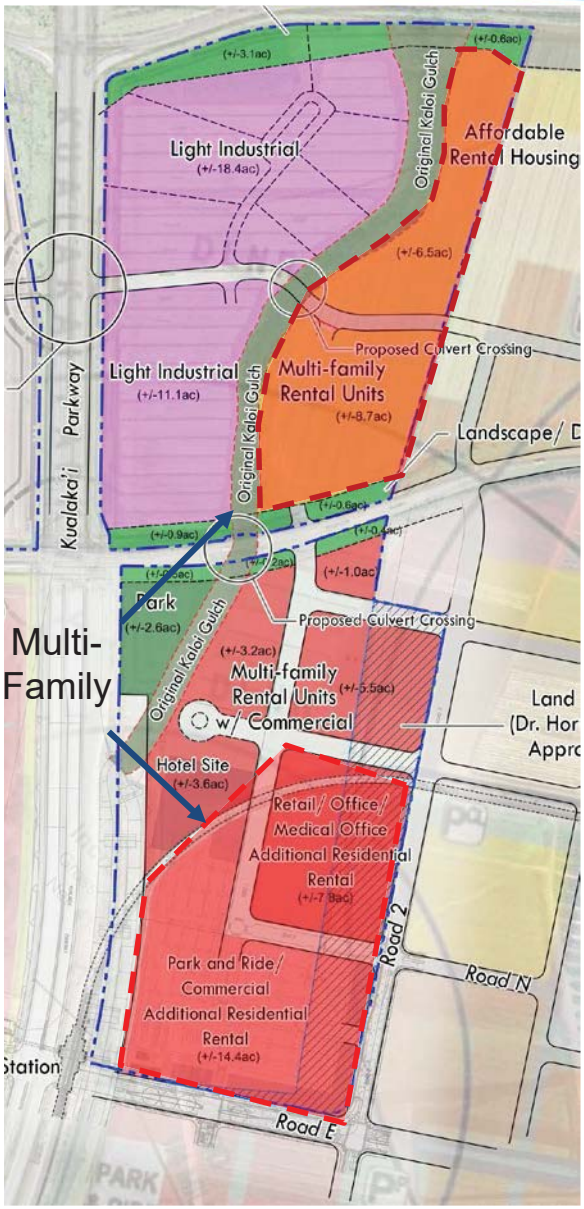
MULTI-FAMILY RESIDENTIAL RENTAL

ASSUMPTIONS

Number of Units - The Rental Housing Study provided by Ricky Cassiday (Data@Work) concluded a potential multi-family residential rental demand for the DLNR East Kapolei Lands of 2,110 units. However, after planning for land and infrastructure constraints, the conceptual plan provides for a lesser amount at 1,000 units.

Building Area – The gross building area of 661,200 square feet was calculated as the total units multiplied by the average unit size of 950 square feet.

ASSUMPTIONS	
Number of Units	1,000
Average Unit Size (sf)	950
Total Unit Area (sf)	950,000
Gross Building Area	950,000
Average occupancy rate	95%
Occupied Units	950
Average Monthly Rent (50% to 60% AMI HUD Rent Guidelines for 2BR/3BR)	$1,608
Operating Expense (% of revenues)	40%



Operational Revenue –The market demand study also indicates a deep demand beyond the 1,700 units for those serving the lower income households (30% to 60% AMI). With this in mind, and considering DLNR is a public agency, we assumed that affordable housing units would be provided. We used the HUD Affordable Rent Guidelines for 2019 to estimate the potential unit rents. For the 50% to 60% AMI households, gross rents averaged $1,608 per month. After applying a market average occupancy rate of 95%, the annual gross rental revenue (2019) is $18.3 million. A portion of this revenue goes towards the operating expenses of the building.

Operational Expenses – A market benchmark of 40% of revenues was used as an estimate of operating expenses. Direct expenditures include utilities, maintenance and repair, professional services, and finance and insurance.

Construction Costs - The general assumption used for this analysis for hard costs for an apartment building is $425 per square foot. The soft costs assumption is projected to be 20% of the total hard costs. The total projected development cost for the proposed 1,000 units is $484.5 million dollars ($2019).

SUMMARY OF FINDINGS

Based on the Residential Rental Market Study for the DLNR East Kapolei Lands, there is an average annual projected demand of 162 units per year from 2023 to 2035. We projected the 720-unit project at the TOD site would be built first and delivered in 2024 after the rail is assumed to be operating. The second building (280 units) would be delivered five years later in 2029.

CONSTRUCTION IMPACT

New Spending/Expenditures – Development of the two multi-family residential projects (1,000 units) would bring an estimated $484.5 million ($2019 value) to the economy phased in 2022/2023 and 2027/2028. A secondary impact (indirect and induced) is projected to yield another $1.0 billion in economic output.

Estimated Construction Costs (2019):		TOD residential	KP East
Hard Costs	$425 per square foot	$ 290,700,000	$ 113,050,000
Soft Costs	20% of hard costs	$ 58,140,000	$ 22,610,000
Total Construction Costs (rounded)		$ 348,840,000	$ 135,660,000

New Net Earnings – During the construction of the two multi-family residential buildings, there is approximately $147.0 million ($2019) in new net earnings/direct income. We utilized the Bureau of Labor Statistics Occupational Employment and Wage Estimates for Hawaii (May 2018) ("BLS OES") for Construction and Extraction Occupations of $68,730 as the average wage per construction employee.

New Full-Time Employee (FTE) Jobs – The construction of the two buildings will create about 2,140 jobs during the development period. About 1,170 indirect and induced jobs are also projected.

Fiscal Impact – Approximately $16.0 million of GET and income taxes will be generated with the apartment construction. This includes $2.4 million in GET from rental revenues and $13.6 in income taxes.

MULTI-FAMILY RESIDENTIAL RENTAL

OPERATIONAL IMPACT

New Spending/Expenditures – At full-build out and stabilized occupancy (95%), the two multi-family properties are projected to earn approximately $18.3 million ($2019) annually in rents. Of this gross revenue, operating expenses are about 40% based on market benchmarks. This outflow of funds is equal to $7.3 million annually. An additional secondary impact (indirect and induced) in maintenance and repairs is projected to yield another $15.0 million in new spending.

New Net Earnings – The average of the annual wage categories of Property, Real Estate and Community Association Managers; Building and Grounds Cleaning and Maintenance; and Office Admin Support Occupations is $45,000 according to the BLS OES. This is equal to $450,000 spent annually on wages.

New Full-Time Employee (FTE) Jobs – The typical employee ratio for apartment properties is 1.0 FTE per 100 units. This equates to 10 FTEs for the two proposed apartment buildings.

Fiscal Impact – Approximately $2.0 million ($2019) of GET and income taxes will be generated from operations annually. This includes $863,000 in GET from rental revenues and $156,000 in income taxes. In addition, a total of over $1.7 million is estimated in property taxes annually.

TOTAL ECONOMIC IMPACT

The total estimated economic impact from developing two multi-family apartment properties on the DLNR East Kapolei lands is $1.9 billion ($2019) from construction and $26.4 million ($2019) annually from operations at full buildout and stabilized occupancy. Job creation includes 2,140 direct FTE jobs during both construction periods and 10 permanent FTEs from operations. A detailed schedule which includes inflation (3.0% annually) and supporting economic impact analysis model is presented in the appendix.

TOTAL ECONOMIC IMPACT OF DEVELOPMENT ON DLNR EAST KAPOLEI LANDS
MULTI-FAMILY RESIDENTIAL RENTAL

Construction Impact	Output ($000)	FTE Jobs	Earnings ($000)	GET ($000s)	Income Taxes ($000s)	Property Taxes ($000)	TOTAL ($000)
Direct	$484,500	2,140	$147,050	$2,423	$13,566		$647,539
Indirect & Induced	$1,017,320	1,170	$271,210				$1,288,530
Total Impact	**$1,501,820**	**3,310**	**$418,260**	**$2,423**	**$13,566**		**$1,936,069**
Operational Impact (Annual)							
Direct	$7,330	10	$470	$863	$156	$1,696	$10,516
Indirect & Induced	$14,998	17	$840				$15,838
Total Impact	**$22,328**	**27**	**$1,310**	**$863**	**$156**	**$1,696**	**$26,354**

Note: 2019 estimate. Does not account for inflation and phasing of development.

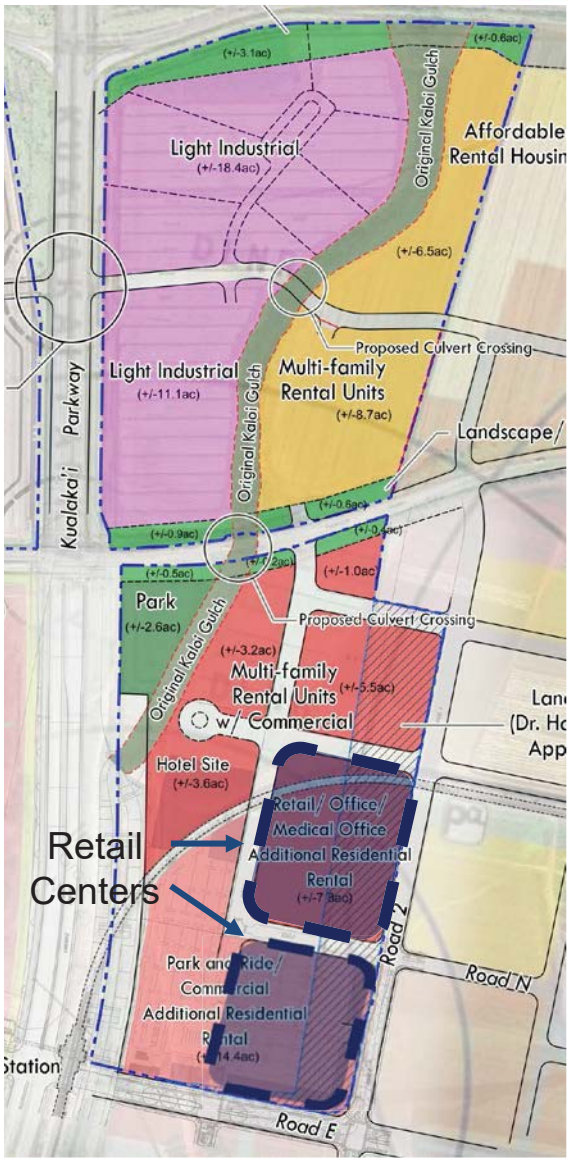
RETAIL

ASSUMPTIONS

Gross Leasable Area – The retail market demand study by Colliers International concluded there is moderate market support for up to 146,000 square feet of retail space on the DLNR East Kapolei Lands by 2039. The conceptual plan presents 114,000 square feet of total retail space in two buildings on the TOD Mixed-Use site. There is an estimated 50,000 square feet of retail space in a commercial building bordered by Roads 2, N, and C and approximately 64,000 square feet in a 1- to 2-story building on the park and ride lot. There is also potential for up to 96,000 square feet of ground floor space under the multi-family units. The impact of this inventory was not analyzed as projected retail demand was none to minimal for the projected delivery timeframe of the multi family units.

New Retail Spending – The retail market demand study assumed a new retail center would generate retail sales equal to $425 to $525 per square foot. To project retail sales for the two planned retail centers, we assumed the center would generate $475 per square foot or $51.4 million in today's dollars. However, only a portion of these sales are a direct output into the economy as there is a wholesale margin to account for. Based on the margins from the 2012 Hawaii State Input-Output Study (Appendix C), retail and transportation margins as a proportion of retail prices is .46 resulting in an estimated $23.5 million in direct expenditures.

Operational Revenue – Retail rents are typically comprised of a base rent, operating expense recovery (CAM), and percentage rent on sales. The current average market rent for Kapolei is between $4.16 and $5.17 psf/mo. A new development would likely garner rents in the upper end of this range at around $5.00 psf/mo for a potential gross revenue at stabilized occupancy (95%) of $6.5 million for both centers. In addition, tenants pay an operating expense recovery based on their pro-rata share of building area.



ASSUMPTIONS

Retail Center sf		114,000
Average occupancy rate		95%
Occupied sf		108,300
Sales psf	$	475.00
Base Rental Rate psf/month (2019)	$	5.00
Operating Expenses psf/month (2019)	$	1.45

Operational Expenses – Expenses include utilities, maintenance and repair, professional services, security, marketing/promotion, real property taxes, and insurance. Projected annual operating expenses at a market rate of $1.45 psf/mo is equal to $1.89 million for both properties.

SUMMARY OF FINDINGS

Based on the Industrial and Commercial Market Demand Assessment Study by Colliers International for the DLNR East Kapolei Lands, there is no new projected retail demand until 2029 with up to 109,000 square feet through 2034. Additional demand of up to 58,000 square feet is projected from 2034 to 2039. Our analysis assumed the Park & Ride retail center would be built first and delivered in 2031 and the other TOD Site center would be delivered in 2036.

CONSTRUCTION IMPACT

New Spending/Expenditures – Development of the two retail centers would bring an estimated $17.4 million (2019 value) to the Hawaii economy phased in 2029/2030 and 2034/2035. An additional secondary impact (indirect and induced) is projected to yield another $264.2 million in new spending.

Estimated Construction Costs ($2019) ($000s		Park & Ride	TOD
	Leasable Area (sf)	64,000	50,000
Hard Costs	$400 per square foot	$25,600	$20,000
Soft Costs	20% of hard costs	$5,120	$4,000
Total Construction Costs (rounded)		$30,720	$24,000

New Net Earnings – During the construction of the two retail properties, there is approximately $16.6 million ($2019) in new net earnings/direct income. We utilized the Bureau of Labor Statistics Occupational Employment and Wage Estimates for Hawaii (May 2018) ("BLS OES") for Construction and Extraction Occupations of $68,730 as the average wage per construction employee.

New Full-Time Employee (FTE) Jobs – The construction of the two buildings will create 242 jobs over the two construction periods. Approximately 130 indirect and induced jobs are also projected.

Fiscal Impact – Approximately $4.5 million of GET on construction costs and $1.5 million in income taxes will be generated from retail center development.

OPERATIONAL IMPACT

New Spending/Expenditures – At full-build out and stabilized occupancy (95%), the two retail properties are projected to generate approximately $23.6 million ($2019) in retail sales annually (after margins). The properties will earn an estimated $6.5 million in annual gross rental revenue (excluding operating expense recovery). Operating expenses are projected to pump about $1.1 million annually (60% capture for local expenditures). An additional secondary impact (indirect and induced) is projected to yield another $25.4 million in new spending.

New Full-Time Employee (FTE) Jobs – We assumed 24 FTEs were needed for retail center operations of both centers on the conceptual plan. The typical employee ratio for retail shops in Hawaii according to the International Council of Shopping Centers is 2.2 per 1,000 square feet or 251 employees total for both centers.

New Net Earnings – The average of the annual wage categories for Retail Center Operations FTEs of Property, Real Estate and Community Association Manager and Building and Grounds Cleaning and Maintenance is $47,000 according to the BLS OES. This is equal to $1.1 million spent annually on wages. In addition, Retail Salespersons were assumed to earn about $28,310 annually for a total of $7.1 million in wages annually.

Fiscal Impact – Approximately $2.4 million ($2019) of GET from retail sales and $543,000 in state income taxes will be generated from operations. In addition, a total of over $706,000 is estimated in annual property taxes once the centers are built.

TOTAL ECONOMIC IMPACT

The total estimated economic impact from developing two retail center properties on the DLNR East Kapolei lands is $222.9 million ($2019) from construction and $19.6 million ($2019) annually from operations. Job creation includes 372 FTE jobs from construction and 284 FTEs from operations. A detailed schedule which includes inflation (3.0% annually) and the supporting economic impact analysis model is presented in the appendix.

TOTAL ECONOMIC IMPACT OF DEVELOPMENT ON DLNR EAST KAPOLEI LANDS RETAIL CENTERS

Construction Impact	Output ($000)	FTE Jobs	Earnings ($000)	GET ($000s)	Income Taxes ($000s)	Property Taxes ($000)	TOTAL ($000)
Direct	$54,720	242	$16,610	$4,487	$1,532		$77,349
Indirect & Induced	$114,900	130	$30,630				$145,530
Total Impact	**$169,620**	**372**	**$47,240**	**$4,487**	**$1,532**		**$222,879**
Operational Impact (Annual)							
Direct	$1,884	275	$8,229	$2,424	$543	$706	$13,786
Indirect & Induced	$3,856	9	$2,008				$5,863
Total Impact	**$5,740**	**284**	**$10,237**	**$2,424**	**$543**	**$706**	**$19,650**

Note: 2019 estimate. Does not account for inflation and phasing of development.

OFFICE

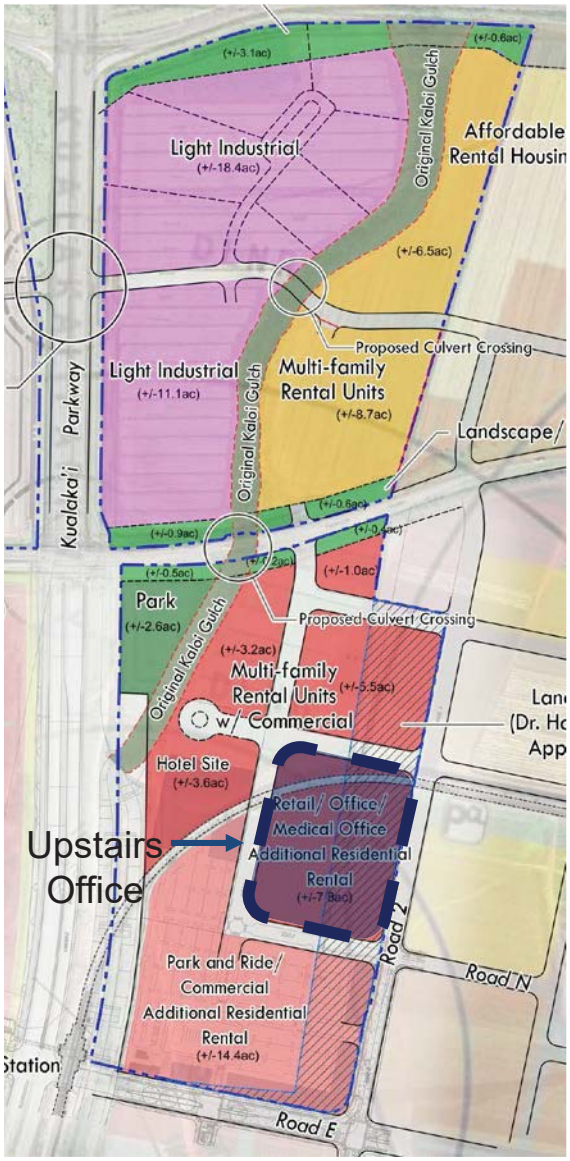
ASSUMPTIONS

Gross Leasable Area – The office market demand study by Colliers International concluded there is moderate market support for about 15,000 to 20,000 square feet of office space on the DLNR East Kapolei Lands by 2039. The conceptual plan includes 20,000 square feet of general office and medical office space located on the second floor of the commercial building at the TOD Mixed Use site.

Operational Revenue – It is difficult to gauge office business revenues due the diverse types of businesses that occupy office space. But we can estimate the economic impact of the operating an office building.

Office rents are typically comprised of a base rent and operating expense recovery. The current average market base rent for Kapolei office space is between $2.00 and $3.00 psf/mo. A new development would likely garner rents in the upper end of this range. At $3.00 psf/mo, base rent revenue is equal to $684,000 per year.

Operational Expenses – In addition, tenants pay an operating expense recovery based on their pro-rata share of building area. Expenses include utilities, janitorial, maintenance and repair, professional services, real property taxes, and insurance. Current market average operating expense rates are $1.25 psf/mo which equals $300,000 annually.



ASSUMPTIONS	
Gross Leasable Area (sf)	20,000
General Office	15,000
Medical Office	5,000
Average occupancy rate	95%
Occupied sf	19,000
Base Rental Rate psf/month (2019)	$2.75
Operating Expenses psf/month (2019)	$1.25

OFFICE

SUMMARY OF FINDINGS

Based on the Industrial and Commercial Market Demand Assessment Study by Colliers International for the DLNR East Kapolei Lands, there is minimal projected office demand over the next 20 years with only up to 23,653 square feet through 2039. Our analysis assumed that about 20,000 square feet of demand could be supported between 2034 and 2039. Since the office space is part of the retail/commercial development on the TOD Mixed Use site, it will be developed at the same time in 2035.

CONSTRUCTION IMPACT

New Spending/Expenditures – Even though the office space is planned for part of the second level of the commercial building at the TOD Mixed Use site, we segregated the development costs from the retail space. The estimated hard costs for the office space vary between general office space ($300 psf) and medical office ($400 psf). Medical office is generally more expensive to build because of infrastructure needed for equipment, exam rooms, sinks, and so on. Development of the office space would bring an estimated $8.6 million (2019 value) to the Hawaii economy in 2035 when the commercial building is constructed. An additional secondary impact (indirect and induced) is projected to yield another $18.0 million in new spending.

Estimated Construction Costs ($2019)($000s)		TOD Mixed Use
	Leasable Area (sf)	20,000
Hard Costs	$393 per square foot	$ 7,150
Soft Costs	20% of hard costs	$ 1,430
Total Construction Costs (rounded)		$ 8,580

New Full-Time Employee (FTE) Jobs – The new construction will create an estimated 38 jobs. Approximately 20 indirect and induced jobs are also projected.

New Net Earnings – During the construction of the commercial building, there is approximately $2.6 million ($2019) in new net earnings/direct income from the office space construction. We utilized the Bureau of Labor Statistics Occupational Employment and Wage Estimates for Hawaii (May 2018) ("BLS OES") for Construction and Extraction Occupations of $68,730 as the average wage per construction employee.

Fiscal Impact – Approximately $43,000 of GET and $470,000 in income taxes will be generated from the office space development.

OPERATIONAL IMPACT

New Spending/Expenditures – The office space will earn an estimated $684,000 in annual gross rental revenue (excluding operating expense recovery). Operating expenses are projected to add about $300,000 annually upon stabilized occupancy (95%). An additional secondary impact (indirect and induced) is projected to yield another $614,000 in economic impact.

New Net Earnings and FTEs– Since the office space is a part of the larger property, we have assumed that management and operations would fall under the retail component. Thus, there are no new earnings or employees projected for the operations of the office space.

However, we have projected the number of tenant employees using the market benchmark ratio of 1.0 FTE per 150 square feet of space. This results in 127 FTEs for office tenants. Wages or direct personal income is estimated at $7.36 million based on an annual average wage of $58,074 for Finance & Insurance, Professional Services, and Healthcare Practitioners and Support.

Fiscal Impact – Approximately $32,000 ($2019) of GET from office rents will be generated from operations. Office tenant employees will generate approximately $672,000 in annual income taxes. In addition, the office portion of the building will contribute an estimated $111,000 in annual property taxes.

TOTAL ECONOMIC IMPACT

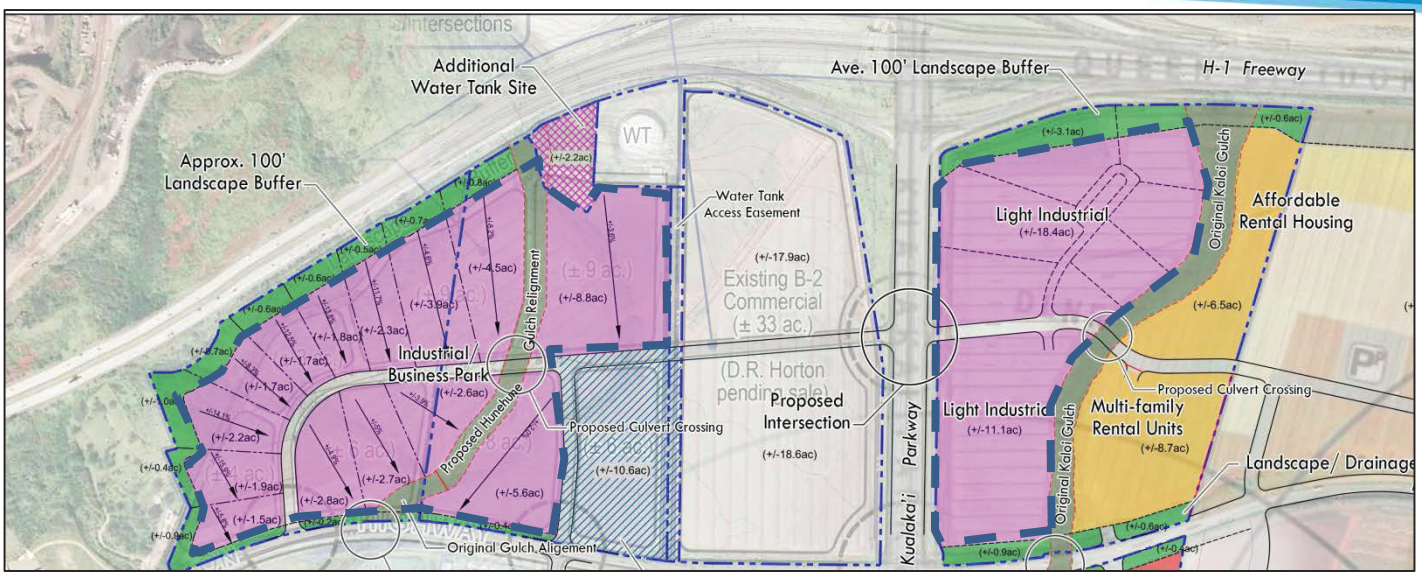
The total estimated economic impact from developing office space on the DLNR East Kapolei lands is $26.6 million ($2019) from construction and $8.2 ($2019) annually from operations. Job creation includes 106 FTE jobs from construction and 127 FTE jobs from tenants. A detailed schedule which includes inflation (3.0% annually) and supporting economic impact analysis model is presented in the appendix.

TOTAL ECONOMIC IMPACT OF DEVELOPMENT ON DLNR EAST KAPOLEI LANDS OFFICE

Construction Impact	Output ($000)	FTE Jobs	Earnings ($000)	GET ($000s)	Income Taxes ($000s)	Property Taxes ($000)	TOTAL ($000)
Direct	$8,580	38	$2,600	$43	$207		$11,430
Indirect & Induced	$18,020	20	$4,800				$22,820
Total Impact	**$26,600**	**58**	**$7,400**	**$43**	**$207**		**$34,250**
Operational Impact (Annual)							
Direct	$300	127	$7,360	$32	$255	$111	$8,057
Indirect & Induced	$614		$0				$614
Total Impact	**$914**	**127**	**$7,360**	**$32**	**$255**	**$111**	**$8,671**

Note: 2019 estimate. Does not account for inflation and phasing of development.

INDUSTRIAL



Gross Leasable Area – The industrial market demand study by Colliers International concluded there is market support for up to 47.9 acres of the 62.7 acres of DLNR East Kapolei industrial lands from 2024 to 2039. This equates to an over 1.04 million square feet of industrial building area assuming a 0.5 FAR. It should be noted that there may be additional demand beyond 2039 to fill the remaining 14.8 acres but that analysis is beyond the scope of this study.

ASSUMPTIONS	
Industrial Park lands (usable acres)	47.9
Total Building Area (sf) at FAR 0.5	1,043,262
Average occupancy rate	95%
Occupied sf	991,099
Average Base Rent (psf/mo) ($2019)	$1.40
Average Operating Expense (psf/mo)($2019)	$0.36

Operational Revenue – Just as with office space, is is difficult to project industrial business revenues due the diverse types of industrial businesses. Thus, while the economic contribution of a new industrial park is greater, we have only estimated the economic impact of operating an industrial park.

Industrial rents are typically comprised of a base rent and operating expense recovery. The current average market base rent for Kapolei warehouse space is $1.33 psf/mo. A new development would likely command rents above this average rate. At $1.40 psf/mo, base rent revenue is equal to $16.6 million per year at full buildout.

Operational Expenses – Operating expenses are about a quarter of office/retail expenses as there is less common area to maintain. Expenses include utilities, maintenance and repair, professional services, real property taxes, and insurance. Current market average operating expense rates are $0.36 psf/mo which equals $4.28 million annually.

INDUSTRIAL

SUMMARY OF FINDINGS

Based on the Industrial and Commercial Market Demand Assessment Study by Colliers International for the DLNR East Kapolei Lands, there is market demand for about 48 acres of industrial land over the next 20 years.

The conceptual plan includes 128.9 acres of industrial lands in two industrial parks, with 62.7 acres as developable industrial land area. Kualakai Parkway West will have 37.6 acres and Kualakai Parkway East will have 25.1 acres of developable industrial land. Our analysis assumed that Kualakai Parkway West lands would be absorbed between 2029 and 2034 and a portion of Kualakai Parkway East would be absorbed from 2034 to 2039. We also assumed an average annual absorption rate of 4.0-acres. Construction on each parcel was projected to be completed two-years after lease secured.

CONSTRUCTION IMPACT

New Spending/Expenditures – Development of industrial buildings could bring $175.3 million (2019 value) to the Hawaii economy over the next 20 years. An additional secondary impact (indirect and induced) is projected to yield another $337.4 million in new spending.

Estimated Construction Costs ($2019)($000s)		West	East	Total
	Leasable Area (sf)	818,928	224,334	1,043,262
Hard Costs	$140 per square foot	$114,650	$31,407	$146,057
Soft Costs	20% of hard costs	$22,930	$6,281	$29,211
Total Construction Costs (rounded)		$137,580	$37,688	$175,268

New Full-Time Employee (FTE) Jobs – The new construction will create an estimated 709 jobs during the development periods. Approximately 390 indirect and induced jobs are also projected.

New Net Earnings – During the construction of the industrial properties, there is approximately $48.8 million ($2019) in new net earnings and wages. We utilized the Bureau of Labor Statistics Occupational Employment and Wage Estimates for Hawaii (May 2018) ("BLS OES") for Construction and Extraction Occupations of $68,730 as the average wage per construction employee.

Fiscal Impact – Approximately $803,000 of GET and $1.3 million in income taxes will be generated from industrial warehouse development.

OPERATIONAL IMPACT

New Spending/Expenditures – The aggregate industrial space of 991,000 square feet (stabilized) will earn an estimated $16.6 million in annual gross rental revenue (excluding operating expense recovery)($2019). Operating expenses are projected to add about $2.57 million annually (60% capture for local expenditures). An additional secondary impact (indirect and induced) is projected to yield another $1.45 million in new spending.

New Net Earnings and FTEs – The projected industrial land absorption of 4.0 acres annually lends itself to owner-user properties. Thus, we assumed that the properties would be self-managed and didn't account for any operations FTEs. However, we did project the number of industrial employees using a market ratio of one FTE per 527 square feet. This amounts to 1,881 FTEs at full-build out.

Average annual wages of common industrial sectors (Construction, Maintenance and Repair, Transportation and Material Moving, and Manufacturing) of $55,813 was used to estimate the wages/direct personal income. At full-buildout, there would be an estimated $105 million in annual wages.

Fiscal Impact – Approximately $785,000 ($2019) of GET from industrial rents will be generated each year from operations. In addition, more than $3.6 million was estimated to be paid in income taxes. Annual property taxes at full buildout will be nearly $2.0 million.

TOTAL ECONOMIC IMPACT

The total estimated economic impact from developing industrial buildings on the DLNR East Kapolei lands is $787.8 million ($2019) from construction and $616 million ($2019) annually from operations. Job creation includes 1,924 FTE jobs from construction and 1,881 jobs from tenant businesses. The projected fiscal impact is $1.4 million in GET and income taxes from construction and $1.8 million annually from new property taxes and operations. A detailed schedule which includes inflation (3.0% annually) and supporting economic impact analysis model is presented in the appendix.

TOTAL ECONOMIC IMPACT OF DEVELOPMENT ON DLNR EAST KAPOLEI LANDS INDUSTRIAL

Construction Impact	Output ($000)	FTE Jobs	Earnings ($000)	GET ($000s)	Income Taxes ($000s)	Property Taxes ($000)	TOTAL ($000)
Direct	$160,662	709	$48,764	$803	$1,365		$211,595
Indirect & Induced	$337,350	390	$89,930				$427,280
Total Impact	**$498,012**	**1,099**	**$138,694**	**$803**	**$1,365**		**$638,875**
Operational Impact (Annual)							
Direct	$4,282	1,881	$104,965	$785	$3,631	$2,073	$115,734
Indirect & Induced	$8,760		$232,313				$241,073
Total Impact	**$13,042**	**1,881**	**$337,277**	**$785**	**$3,631**	**$2,073**	**$356,807**

Note: 2019 estimate. Does not account for inflation and phasing of development.

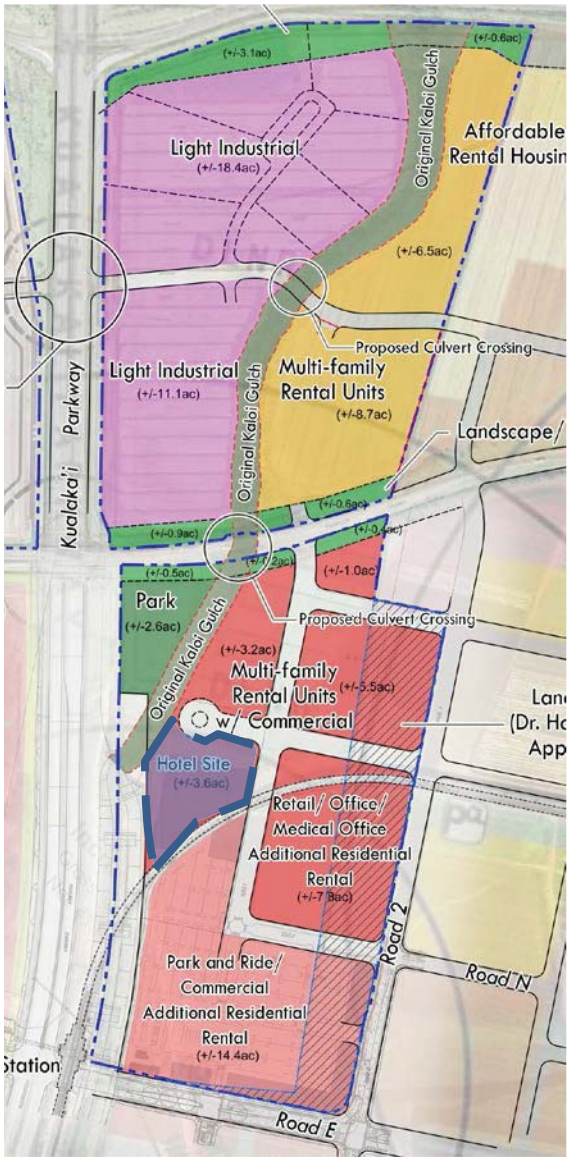
HOTEL

ASSUMPTIONS

Gross Leasable Area – The hotel market demand study by Erik Kloninger Consulting concluded there is enough market support for two (2) 180-room hotels over a 10- to 20-year period. The conceptual plan includes one 180-room hotel on the TOD Mixed Use site.

Operational Revenue – Average Daily Rates ("ADR") for the proposed hotel were projected at $210 (2019 rates). Gross revenues were estimated based on an 85% occupancy rate and a 365-day year to determine the annual room nights. Based on these assumptions, the potential annual gross revenue of the hotel is $11.7 million.

Operational Expenses – Expenses to operate the hotel are assumed to equal 60% of revenues of $7.0 million annually. Expenses include utilities, housekeeping, maintenance and repair, front desk, real property taxes, and insurance.



ASSUMPTIONS		
New Visitor Units		180
Average occupancy rate		85%
Average Daily Rate (ADR)		$210
Estimated Annual Revenue ($000's)		$11,727
Estimated Operating Expenses ($000's)	60% of Revenues	$7,036

HOTEL

SUMMARY OF FINDINGS

Based on the Hotel Market Demand Assessment Study by Erik Kloninger Consulting for the DLNR East Kapolei Lands, there is market demand for two 180-room hotels over the next 20 years.

The conceptual plan includes one 180-room hotel on the TOD site along Kualakai Parkway. Our analysis assumed that there would be enough demand to support a new hotel by 2029.

CONSTRUCTION IMPACT

New Spending/Expenditures – Development of a new 180-room hotel could bring nearly $71.3 million (2019 value) to the Hawaii economy. An additional secondary impact (indirect and induced) is projected to yield another $124.7 million in new spending.

Estimated Construction Costs ($2019)($000s)

Number of Rooms		180
Hard Costs	$330,000 per room	$59,400,000
Soft Costs	20% of hard costs	$11,880,000
Total Construction Costs (rounded)		$71,280,000

New Full-Time Employee (FTE) Jobs – The new construction will create an estimated 262 jobs during development and approximately 400 indirect and induced jobs are also projected.

New Net Earnings – The construction of a new hotel would bring approximately $17.9 million ($2019) in new net earnings/direct income. We utilized the Bureau of Labor Statistics Occupational Employment and Wage Estimates for Hawaii (May 2018) ("BLS OES") for Construction and Extraction Occupations of $68,730 as the average wage per construction employee.

Fiscal Impact – Approximately $921,000 of GET and $500,000 in income taxes will be generated from hotel development.

OPERATIONAL IMPACT

New Spending/Expenditures – A new 180-room hotel (limited service) is projected to earn $11.7 million in annual gross room revenue (excluding operating expense recovery)($2019). Operating expenses are projected to add about $7.0 million annually (60% of room revenues). An additional secondary impact (indirect and induced) is projected to yield another $14.4 million in new spending.

New FTEs and Net Earnings – We assumed an employee ratio of 0.50 FTEs per hotel room for a total of 90 FTEs. Average wages for Building and Grounds Cleaning & Maintenance and Hotel, Motel and Resort Desk Operators is about $40,000 per year. Total annual earnings for the hotel staff is projected at $3.6 million.

Fiscal Impact – The Transient Accommodations Tax ("TAT") is levied on gross room revenues. The subject hotel would generate $1.2 million ($2019) of GET each year at stabilized occupancy. In addition, hotel staff would pay a projected $618,000 in income taxes each year. Property taxes are estimated at $766,000 annually.

TOTAL ECONOMIC IMPACT

The total estimated economic impact from a new 180-room hotel on the DLNR East Kapolei lands is $236.4 million ($2019) from construction and $35 million($2019) annually from operations. Job creation includes 402 direct and indirect and induced FTE jobs from construction and 106 from operations. A detailed schedule which includes inflation (3.0% annually) and supporting economic impact analysis model is presented in the appendix.

TOTAL ECONOMIC IMPACT OF DEVELOPMENT ON DLNR EAST KAPOLEI LANDS
HOTEL

Construction Impact	Output ($000)	FTE Jobs	Earnings ($000)	GET/TAT ($000s)	Income Taxes ($000s)	Property Taxes ($000)	TOTAL ($000)
Direct	$59,400	262	$17,870	$921	$500		$78,691
Indirect & Induced	$124,724	140	$32,960				$157,684
Total Impact	**$184,124**	**402**	**$50,830**	**$921**	**$500**		**$236,375**
Operational Impact (Annual)							
Direct	$7,036	90	$3,600	$1,202	$618	$766	$13,223
Indirect & Induced	$14,397	16	$7,470				$21,867
Total Impact	**$21,433**	**106**	**$11,070**	**$1,202**	**$618**	**$766**	**$35,089**

Note: 2019 estimate. Does not account for inflation and phasing of development.

APPENDIX

- Total Economic Impact Summary (year-by-year)
- Multi-family Residential Rental
    - Economic Impact Model
    - Economic Impact Summary (year-by-year)
- Retail
    - Economic Impact Model
    - Economic Impact Summary (year-by-year)
- Office
    - Economic Impact Model
    - Economic Impact Summary (year-by-year)
- Industrial
    - Economic Impact Model
    - Economic Impact Summary (year-by-year)
- Hotel
    - Economic Impact Model
    - Economic Impact Summary (year-by-year)

DLNR EAST KAPOLEI LANDS ECONOMIC IMPACT																					
YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TOTAL
DELIVERY TIMELINE																					
MULTI FAMILY RESIDENTIAL RENTAL																					
Number of Units	*0*	*0*	*0*	*0*	***720***	*0*	*0*	*0*	*0*	*280*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1,000*
RETAIL																					
Buildings (sf)	*0*	*0*	*0*	*0*	***0***	*0*	*0*	*0*	*0*	*0*	*0*	*64,000*	*0*	*0*	*0*	*0*	*50,000*	*0*	*0*	*0*	*114,000*
OFFICE																					
Buildings (sf)	*0*	*0*	*0*	*0*	***0***	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*20,000*	*0*	*0*	*0*	*20,000*
INDUSTRIAL																					
Acres Absorbed/Leased	*0*	*0*	*0*	*0*	***0***	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*0.0*	*4.0*	*4.0*	*4.0*	*0*	*0*	*48.0*
Buildings (sf)								*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*-*	*87,120*	*87,120*	*87,120*	*1,045,440*
HOTEL																					
Number of Rooms	*0*	*0*	*0*	*0*	***0***	*0*	*0*	*0*	*0*	*0*	*0*	*180*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*180*
ECONOMIC IMPACT ($000s)																					
IMPACT FROM CONSTRUCTION																					
Construction Costs (1)																					
Construction Costs	**-**	**-**	**64,950**	**267,593**	**-**	**-**	**-**	**51,370**	**156,021**	**19,097**	**136,107**	**20,260**	**20,868**	**21,494**	**22,139**	**57,539**	**-**	**24,191**	**24,917**	**25,665**	**$ 912,209**
Indirect & Induced	-	-	136,377	561,874	-	-	-	107,862	327,602	40,098	285,788	42,540	43,817	45,131	46,485	120,817	-	50,795	52,319	53,889	$ 1,915,395
Total New Spending from Construction	**$ -**	**$ -**	**$ 201,327**	**$ 829,468**	**$ -**	**$ -**	**$ -**	**$ 159,232**	**$ 483,623**	**$ 59,195**	**$ 421,894**	**$ 62,800**	**$ 64,684**	**$ 66,625**	**$ 68,623**	**$ 178,356**	**$ -**	**$ 74,987**	**$ 77,236**	**$ 79,553**	**$ 2,827,604**
Construction Employment																					
FTEs	-	-	207	851	**-**	-	-	139	274	110	515	124	131	139	148	301	-	177	187	199	3,501
Indirect & Induced Jobs	-	-	113	464	**-**	-	-	66	137	46	260	49	50	52	53	132	-	58	60	62	1,603
Total Employment from Construction	**-**	**-**	**319**	**1,315**	**-**	**-**	**-**	**205**	**411**	**156**	**775**	**173**	**182**	**191**	**201**	**433**	**-**	**235**	**247**	**261**	**5,104**
Construction Wages																					**$ -**
New Earnings from Construction	$ -	$ -	$ 14,193	$ 58,476	$ -	$ -	$ -	$ 7,844	$ 16,842	$ 5,313	$ 42,396	$ 5,637	$ 5,806	$ 5,980	$ 6,159	$ 22,691	$ -	$ 6,731	$ 6,933	$ 7,141	$ 212,140
Indirect & Induced Wages	-	-	26,177	107,847	-	-	-	14,467	31,061	9,799	78,192	10,396	10,708	11,029	11,360	41,849	-	12,413	12,786	13,169	$ 391,254
Total Wages from Construction	**$ -**	**$ -**	**$ 40,370**	**$ 166,323**	**$ -**	**$ -**	**$ -**	**$ 22,311**	**$ 47,903**	**$ 15,112**	**$ 120,588**	**$ 16,033**	**$ 16,514**	**$ 17,009**	**$ 17,520**	**$ 64,539**	**$ -**	**$ 19,144**	**$ 19,718**	**$ 20,310**	**$ 603,394**
Tax Revenue																					
GET	$ -	$ -	$ 325	$ 1,338	$ -	$ -	$ -	$ 257	$ 780	$ 95	$ 681	$ 101	$ 104	$ 107	$ 111	$ 288	$ -	$ 121	$ 125	$ 128	**$ 4,561**
Income Taxes	-	-	1,819	7,493	-	-	-	1,438	4,369	535	2,032	567	584	602	620	1,369	-	677	698	719	**$ 23,521**
Total Tax Revenue from Construction	**$ -**	**$ -**	**$ 2,143**	**$ 8,831**	**$ -**	**$ -**	**$ -**	**$ 1,695**	**$ 5,149**	**$ 630**	**$ 2,713**	**$ 669**	**$ 689**	**$ 709**	**$ 731**	**$ 1,657**	**$ -**	**$ 798**	**$ 822**	**$ 847**	**$ 28,082**
IMPACT FROM OPERATIONS																					
Operations Revenue																					
New Retail Spending	-	-	-	-	**-**	-	-	-	-	-	-	$ 18,309	$ 18,676	$ 19,049	$ 19,430	$ 19,819	$ 32,344	$ 32,991	$ 33,650	$ 34,323	$ 228,591
Indirect and Induced	-	-	-	-	**-**	-	-	-	-	-	-	33,759	34,772	35,815	36,889	37,996	69,711	71,802	73,956	76,175	470,873
Total New Spending	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**$ 52,068**	**$ 53,447**	**$ 54,864**	**$ 56,319**	**$ 57,814**	**$ 102,054**	**$ 104,793**	**$ 107,606**	**$ 110,498**	**$ 699,464**
Building Operations	-	-	-	-	**$ 5,940**	$ 6,118	$ 6,302	$ 6,491	$ 6,963	$ 10,128	$ 10,710	$ 22,364	$ 23,300	$ 24,263	$ 25,255	$ 26,276	$ 28,763	$ 29,515	$ 30,663	$ 31,844	$ 294,895
Indirect & Induced	-	-	-	-	**12,153**	12,518	12,894	13,280	14,264	20,756	21,964	45,828	47,761	49,752	51,802	56,292	59,127	60,662	63,029	65,466	$ 607,550
otal New Spending from Building Operations	**$ -**	**$ -**	**$ -**	**$ -**	**$ 18,094**	**$ 18,636**	**$ 19,196**	**$ 19,771**	**$ 21,228**	**$ 30,884**	**$ 32,674**	**$ 68,192**	**$ 71,061**	**$ 74,015**	**$ 77,057**	**$ 82,568**	**$ 87,890**	**$ 90,177**	**$ 93,692**	**$ 97,310**	**$ 902,445**
Operations Employment																					
Building Tenants	-	-	-	-	**-**	-	-	-	165	331	496	802	967	1,133	1,298	1,463	1,865	1,865	2,031	2,196	2,196
Building Operations	-	-	-	-	**7**	7	7	7	7	10	10	109	109	109	109	109	118	118	118	118	118
Indirect & Induced	-	-	-	-	13	13	13	13	13	17	17	54	54	54	54	54	76	76	76	76	76
Total FTEs from Operations	**-**	**-**	**-**	**-**	**20**	**20**	**20**	**20**	**185**	**358**	**523**	**966**	**1,131**	**1,296**	**1,462**	**1,627**	**2,059**	**2,059**	**2,224**	**2,390**	**2,390**
Operations Wages																					
Building Tenant wages	-	-	-	-	**-**	-	-	-	$ 11,688	$ 24,077	$ 37,200	$ 69,397	$ 84,634	$ 100,722	$ 117,700	$ 135,606	$ 171,063	$ 176,195	$ 197,188	$ 219,283	$ 1,344,754
Building Operations	-	-	-	-	**381**	393	404	416	429	614	632	23,944	24,612	25,300	26,007	26,734	44,065	45,332	55,718	47,152	322,133
Indirect & Induced Wages	-	-	-	-	**681**	701	722	744	766	1,096	1,129	12,519	12,791	13,069	13,354	13,644	14,576	14,881	31,414	14,038	146,123
Total Wages from Operations	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,062**	**$ 1,094**	**$ 1,127**	**$ 1,160**	**$ 12,883**	**$ 25,787**	**$ 38,961**	**$ 105,859**	**$ 122,037**	**$ 139,091**	**$ 157,061**	**$ 175,985**	**$ 229,703**	**$ 236,407**	**$ 284,321**	**$ 280,473**	**$ 1,813,010**
Tax Revenue																					
GET/TAT	-	-	-	-	**$ 622**	$ 640	$ 660	$ 679	$ 816	$ 1,099	$ 1,249	$ 4,566	$ 4,801	$ 5,043	$ 5,292	$ 5,548	$ 6,709	$ 6,855	$ 7,161	$ 7,476	$ 59,215
Property Tax	-	-	-	-	**1,374**	1,415	1,458	1,502	1,766	2,658	2,957	4,343	4,688	5,036	5,395	5,765	6,850	6,970	7,387	7,817	67,381
Income Tax	-	-	-	-	**127**	131	135	139	547	1,037	1,497	2,598	3,131	3,690	4,280	4,903	6,170	6,355	7,084	7,850	49,673
TOTAL FISCAL IMPACT	**$ -**	**$ -**	**$ -**	**$ -**	**$ 2,123**	**$ 2,186**	**$ 2,252**	**$ 2,320**	**$ 3,129**	**$ 4,794**	**$ 5,702**	**$ 11,507**	**$ 12,619**	**$ 13,770**	**$ 14,968**	**$ 16,215**	**$ 19,729**	**$ 20,180**	**$ 21,632**	**$ 23,143**	**$ 176,269**

MULTI-FAMILY RESIDENTIAL RENTALS

ASSUMPTIONS	
Number of Units	1,000
Average Unit Size (sf)	950
Total Unit Area (sf)	950,000
Gross Building Area	950,000
Average occupancy rate	95%
Occupied Units	950
Average Monthly Rent (50% to 60% AMI HUD Rent Guidelines for 2BR/3BR)	$1,608
Operating Expense (% of revenues)	40%
Total Gross Annual Rent Revenue (2019)	$18,325,500

MULTI-FAMILY RESIDENTIAL RENTALS

OPERATIONAL IMPACT: Direct, Indirect & Induced Expenditures

(2019 Dollars, $000s)

	Assumptions	
Revenues from Operations		
Total Units		1,000
Average occupancy rate		95%
Occupied Units		950
Average Monthly Rent		$1,608
Gross Annual Revenue at Full- Build out		**$18,326**
Operating Expenses	40% of gross revenues	$7,330
Total Annual Direct Expenditures		**$7,330**
Indirect and induced expenditures (rounded) (1)		
Maintenance & Repairs	$2.05 per $ of direct expenditure	$14,998
Total indirect and induced expenditures (rounded)		$ 14,998
Total direct, indirect and induced visitor expenditures (rounded)		**$22,300**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

MULTI-FAMILY RESIDENTIAL RENTALS
OPERATIONAL IMPACT: Direct, Indirect & Induced Earnings/Personal Income

PROJECTED DIRECT, INDIRECT AND INDUCED PERSONAL INCOME

(2019 Dollars)

	Assumptions	
Direct operational employment		
(FTE persons) (rounded):		
Operational	1.0 per 100 units	10
Total direct operational FTE employment (rounded)		**10**
Indirect and induced employment (3)	2.4 employees per $million direct expenditure	17
Total direct, indirect and induced employment(rounded)		**30**
Estimated average annual wages per full-time equivalent employee:		
Operational(2)	Median Income $47,000	$470
Direct operational personal income($000s)(rounded):		
Operational		$470
Total direct operational income($000s)(rounded)		$470
Indirect and induced operational personal income($000s)(rounded):		
Operational	$1.78 per $ of direct personal income	$840
Total indirect and induced operational income($000s)(rounded)		$840
Total direct, indirect and induced operational income($000s)(rounded)		**$1,310**

(1) Bureau of Labor Statistics Occupational Employment and Wage Estimates - Hawaii (May 2018) for Property, Real Estate & Community Association Managers, Building and Grounds Cleaning and Maintenance

MULTI-FAMILY RESIDENTIAL RENTALS

CONSTRUCTION IMPACT

(2019 Dollars;$000s)

	Assumptions		
Total Building Area (sf) (1)			950,000
Estimated Construction Costs (2019):			
Hard Costs	$425 per square foot	$	403,750
Materials	65% of total	$	262,438
Labor	35% of total	$	141,313
Soft Costs	20% of hard costs	$	80,750
Total Construction Costs (rounded)		**$**	**484,500**
Indirect and induced expenditures (2)	$2.10 per $ of direct expenditure		1,017,320
Total direct, indirect and induced expenditures (rounded)		**$**	**1,501,800**
Direct employment (3)			
Construction	4.4 employees per $million direct expenditure		2,140
Total direct employment			2,140
Indirect and induced employment (3)	2.4 employees per $million direct expenditure		1,170
Total direct, indirect and induced employment(rounded)			**3,310**
Direct income ($000s) (2)			
Construction	$68,730 annual mean wage	$	147,048
Total direct income (rounded)			147,050
Indirect and induced income (3)	$1.84 per $ of direct personal income	$	271,210
Total direct, indirect and induced construction income (rounded)		**$**	**418,300**

(1) Gross building area includes 5% for common areas/circulation.

(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

MULTI-FAMILY RESIDENTIAL RENTALS

FISCAL IMPACT

ESTIMATED ANNUAL COUNTY REAL PROPERTY TAXES

(2019 Dollars)

	Assumptions	
Number of Units		1,000
Estimated real property taxes (rounded):		
Building		$3.50
Land		$3.50
Building	Value equal to construction cost	484,500
Land	assessed value	n/a
Total estimated real property taxes($000s)		**$1,696**

ESTIMATED STATE TAX REVENUES

(2019 Dollars, $000s)

Revenue Source	Assumptions	
General excise tax (GET):		
On construction expenditures		$2,423
Rent revenue		$863
Total GET		$3,286
Income taxes -		
Construction	0.021 per $ direct expenditure	$13,566
Operational	0.028 per $ direct expenditure	156
Total income taxes		$13,722
Summary		
GET		$3,286
Income taxes		13,722
Total revenues to the State (rounded)		**$17,008**

MULTI-FAMILY RESIDENTIAL ECONOMIC IMPACT ($000s)																					
								Projected Economic Impact													
YEAR	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
Number of New Units			*Planning & Construction*		*720*			*Planning & Construction*		*280*											
IMPACT FROM CONSTRUCTION																					
Construction Costs (1)																					
New Materials Spending			$ 48,111	$ 198,217				$ 21,690	$ 89,362												357,380
New Labor Spending			16,839	69,376				11,679	48,118												146,012
Total Construction Costs			$ 64,950	$ 267,593				$ 33,369	$ 137,480												**503,392**
Indirect & Induced Spending			$ 136,377	$ 561,874				$ 70,066	$ 288,671												1,056,989
Total New Spending from Construction			**$ 201,327**	**$ 829,468**				**$ 103,435**	**$ 426,151**												**$ 1,560,381**
Construction Employment																					
FTEs			207	851				41	170												1,269
Indirect & Induced Jobs			113	464				23	93												692
Total Employment from Construction			**319**	**1,315**				**64**	**263**												**1,961**
Construction Wages																					
New Earnings from Construction			$ 14,193	$ 58,476				$ 2,836	$ 11,683												87,188
Indirect & Induced Wages			$ 26,177	$ 107,847				$ 5,230	$ 21,548												160,801
Total Wages from Construction			**$ 40,370**	**$ 166,323**				**$ 8,066**	**$ 33,231**												**$ 247,989**
Tax Revenue																					
GET			$ 325	$ 1,338				$ 167	$ 687												2,517
Income Taxes			1,819	7,493				934	3,849												14,095
Total Tax Revenue from Construction			**$ 2,143**	**$ 8,831**				**$ 1,101**	**$ 4,537**												**$ 16,612**
IMPACT FROM OPERATIONS																					
Operational Spending																					
Building Operations					$ 5,940	$ 6,118	$ 6,302	$ 6,491	$ 6,686	$ 9,564	$ 9,851	$ 10,147	$ 10,451	$ 10,765	$ 11,088	$ 11,420	$ 11,763	$ 12,116	$ 12,479	$ 12,854	154,034
Indirect & Induced					12,153	12,518	12,894	13,280	13,679	19,568	20,155	20,760	21,383	22,024	22,685	23,366	24,067	24,789	25,532	26,298	315,152
Total New Spending from Operations					**$ 18,094**	**$ 18,636**	**$ 19,196**	**$ 19,771**	**$ 20,365**	**$ 29,133**	**$ 30,007**	**$ 30,907**	**$ 31,834**	**$ 32,789**	**$ 33,773**	**$ 34,786**	**$ 35,829**	**$ 36,904**	**$ 38,011**	**$ 39,152**	**469,186**
Operational Employment																					
Operational New Jobs					7	7	7	7	7	10	10	10	10	10	10	10	10	10	10	10	10
Indirect & Induced					13	13	13	13	13	17	17	17	17	17	17	17	17	17	17	17	17
TOTAL New FTE Jobs					**20**	**20**	**20**	**20**	**20**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**
Operational Wages																					
Operational New Earnings					$ 381	$ 393	$ 404	$ 416	$ 429	$ 614	$ 632	$ 651	$ 671	$ 691	$ 711	$ 733	$ 755	$ 777	$ 801	$ 825	9,884
Indirect & Induced					681	701	722	744	766	1,096	1,129	1,163	1,198	1,234	1,271	1,309	1,348	1,388	1,430	1,473	17,651
Total from Operations					**$ 1,062**	**$ 1,094**	**$ 1,127**	**$ 1,160**	**$ 1,195**	**$ 1,710**	**$ 1,761**	**$ 1,814**	**$ 1,868**	**$ 1,924**	**$ 1,982**	**$ 2,041**	**$ 2,103**	**$ 2,166**	**$ 2,231**	**$ 2,298**	**27,535**
Tax Revenue																					
GET from Rents					$ 622	$ 640	$ 660	$ 679	$ 700	$ 863	$ 889	$ 916	$ 944	$ 972	$ 1,001	$ 1,031	$ 1,062	$ 1,094	$ 1,127	$ 1,160	14,360
Property Tax					1,374	1,415	1,458	1,502	1,547	2,213	2,279	2,347	2,418	2,490	2,565	2,642	2,721	2,803	2,887	2,974	35,634
Income Tax					127	131	135	139	143	204	210	217	223	230	237	244	251	259	266	274	3,288
TOTAL FISCAL IMPACT					**$ 2,123**	**$ 2,186**	**$ 2,252**	**$ 2,320**	**$ 2,389**	**$ 3,280**	**$ 3,379**	**$ 3,480**	**$ 3,584**	**$ 3,692**	**$ 3,803**	**$ 3,917**	**$ 4,034**	**$ 4,155**	**$ 4,280**	**$ 4,408**	**53,282**

RETAIL CENTER ECONOMIC IMPACT ANALYSIS

ASSUMPTIONS

Retail Center sf		114,000
Average occupancy rate		95%
Occupied sf		108,300
Sales psf	$	475.00
Base Rental Rate psf/month (2019)	$	5.00
Operating Expenses psf/month (2019)	$	1.45

RETAIL CENTER ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Direct, Indirect & Induced Expenditures

(2019 Dollars, $000s)

	Assumptions	
Direct expenditures		
Retail Center sf		114,000
Average occupancy rate		95%
Occupied sf		108,300
Sales psf		$475
Total Annual Sales		$51,443
Retail Trade	35.3% allocation.	$18,159
Wholesale Trade	7.6% allocation.	$3,910
Transportation	2.9% allocation.	$1,492
Total Direct Expenditures (1)		**$23,561**
Indirect & Induced (2)		
Retail Trade	$1.82 per $ of direct expenditure	$33,009
Wholesale Trade	$1.94 per $ of direct expenditure	$7,595
Transportation -	$1.90 per $ of direct expenditure	$2,837
Subtotal		$43,441
Total indirect and induced expenditures (rounded)		$ 43,441
Total direct, indirect and induced expenditures (rounded)		**$67,000**

(1) Based on various retail, wholesale and transportion margins from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

RETAIL CENTER ECONOMIC IMPACT ANALYSIS

ESTIMATED EXPENDITURES GENERATED FROM BUILDING OPERATIONS

(2019 Dollars, $000s)

	Assumptions	
Direct expenditures from Building Operations		
Total Retail (sf)		114,000
Occupancy Rate		95%
Total Occupied Space (sf)		108,300
Rental Revenue @ 95% Occupancy	$5.00 psf/mo	$6,498
Operating Expenses	$1.45 psf/mo	$1,884
Total Annual Direct Expenditures		**$1,884**
Indirect and induced expenditures (rounded) (1)		
Maintenance & Repairs	$2.05 per $ of direct expenditure	$3,856
Total indirect and induced expenditures (rounded)		$ 3,856
Total direct, indirect and induced expenditures (rounded)		**$5,700**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

RETAIL CENTER ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Direct, Indirect & Induced Earnings/Personal Income

(2019)

		Assumptions	
Direct employment (FTE persons) (1):	Retail Sales persons	2.2 per 1,000 sf	251
	Building Operation Employees	12 per center	24
Indirect & induced employment (FTE persons)(2):			
Maintenance & Repair		2.4 employees per $million of direct expenditure	9
Total indirect and induced employment			9
Total direct, indirect & induced employment (FTE persons) (rounded):			**284**
Direct personal income (3):			
Shopping Center FTEs		Meidan Income $28,310	$7,100
Shopping Center Operations FTEs		Median Income $47,000	$1,129
Total direct personal income ($000s) (rounded)			**$8,229**
Indirect and induced personal income($000s)(rounded) (2):			
Maintenance & Repair		$1.78 per $ of direct personal income	$2,008
Total indirect and induced personal income			$2,008
Total direct, indirect and induced personal income ($000s) (rounded):			**$10,237**

(1) Source: ICSC Hawaii Impact Study 2017 - employment density per 1,000 sf

(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

(3) BLS Hawaii - Retail Salespersons, Property, Real Estate & Community Association Managers, Building and Grounds Cleaning and Maintenance Annual Mean Wage - May 2018

RETAIL CENTER ECONOMIC IMPACT ANALYSIS

CONSTRUCTION IMPACT

	Assumptions	
Retail Center Size (square feet)		114,000
Estimated Construction Costs (2019 $000s) (1):		
Hard Costs	$400 per square foot (hard costs)	$45,600
Soft Costs	Soft Costs equal to 20% of Hard Costs	$9,120
Total Construction Costs(rounded)		**$54,720**
Indirect and induced expenditures (2)	$2.10 per $ of direct expenditure	$114,900
Total direct, indirect and induced expenditures (rounded)		**$169,600**
Direct employment (2)		
New construction	4.4 employees per $million direct expenditure	242
Total direct employment		242
Indirect and induced employment (2)	2.4 employees per $million direct expenditure	130
Total direct, indirect and induced employment(rounded)		**370**
Direct income (2019 $000s) (3)		
New construction	$68,730 annual mean wage	$ 16,605
Total direct income (rounded)		16,610
Indirect and induced income (2)	$1.84 per $ of direct personal income	$ 30,630
Total direct, indirect and induced construction income (rounded)		**$ 47,200**

(1) General hard and soft cost estimate based on current market benchmarks.
(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

(3) Based on Bureau of Labor Statistics, May 2018 State Occupational Employment and Wage Estimates for Hawaii - Construction and Extraction OccupationsHawaii

RETAIL CENTER ECONOMIC IMPACT ANALYSIS

FISCAL IMPACT

ESTIMATED ANNUAL COUNTY REAL PROPERTY TAXES

	Assumptions	
Retail Center Size (sf)		114,000
Estimated real property taxes (rounded):		
Building		$12.90
Land		$12.40
Building	Value equal to construction cost	54,720
Land	assessed value	n/a
Total estimated real property taxes ($000s)		**$706**

ESTIMATED STATE REVENUES

(2019 Dollars, $000s)

Revenue Source	Assumptions	
General excise tax (GET):		
On retail spending		$2,424
On construction expenditures	0.082 per $ direct expenditure	$4,487
Total GET		$6,911
Income taxes:		
Operational	0.021 per $ direct expenditure	543
Construction	0.028 per $ direct expenditure	1,532
Total income taxes		2,075
Summary		
GET		$6,911
Income taxes		2,075
Total revenues to the State (rounded)		**$8,986**

RETAIL ECONOMIC IMPACT ($000s)																					
YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TOTAL
										Planning & Construction		*Delivery of Park and Ride Center (64,000 sf)*			*Planning & Construction*		*Delivery of TOD Site Center (50,000 sf)*				
IMPACT FROM CONSTRUCTION																					
Construction Costs (1)																					
Materials											$ 13,418					$ 12,152					$ 25,570
Labor											7,225					6,543					13,768
Total Construction Costs											**$ 20,643**					**$ 18,696**					**$ 39,338**
Indirect & Induced Spending											43,344					39,256					82,600
Total New Spending from Construction											**$ 63,986**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 57,951**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 121,938**
Construction Employment																					
FTEs											136					106					242
Indirect & Induced Jobs											73					57					130
Total Employment from Construction											**209**	**-**	**-**	**-**	**-**	**163**	**-**	**-**	**-**	**-**	**372**
Construction Wages																					
New Earnings from Construction											$ 12,908					$ 13,746					$ 26,654
Indirect & Induced Wages											23,803					25,349					49,152
Total Wages from Construction											**36,711**	**-**	**-**	**-**	**-**	**39,095**	**-**	**-**	**-**	**-**	**$ 75,806**
Tax Revenue																					
GET											$ 103					$ 93					197
Income Taxes											578					523					1,101
Total Tax Revenue from Construction											**$ 681**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 617**	**-**	**-**	**-**	**-**	1,298
IMPACT FROM OPERATIONS																					
Operations Revenue																					
New Retail Spending												$ 18,309	$ 18,676	$ 19,049	$ 19,430	$ 19,819	$ 32,344	$ 32,991	$ 33,650	$ 34,323	228,591
Indirect & Induced												33,759	34,772	35,815	36,889	37,996	69,711	71,802	73,956	76,175	470,873
Total from Retail Spending												$ 52,068	$ 53,447	$ 54,864	$ 56,319	$ 57,814	$ 102,054	$ 104,793	$ 107,606	$ 110,498	699,464
Building Operations												$ 1,315	$ 1,342	$ 1,369	$ 1,396	$ 1,424	$ 2,587	$ 2,639	$ 2,691	$ 2,745	17,508
Indirect & Induced												2,691	2,745	2,800	2,856	5,293	5,399	5,507	5,617	5,729	38,636
Total from Retail Operations												$ 4,007	$ 4,087	$ 4,169	$ 4,252	$ 6,717	$ 7,986	$ 8,145	$ 8,308	$ 8,474	56,144
Total New Spending from Operations												**$ 56,075**	**$ 57,534**	**$ 59,032**	**$ 60,571**	**$ 64,531**	**$ 110,040**	**$ 112,938**	**$ 115,915**	**$ 118,972**	**$ 755,608**
Operations Employment																					
Retail Tenants												141	141	141	141	141	251	251	251	251	251
Retail Center Operations												12	12	12	12	12	24	24	24	24	24
Indirect & Induced												9	9	9	9	9	18	18	18	18	18
Total from Retail Center Operations												21	21	21	21	21	42	42	42	42	42
TOTAL NEW FTE JOBS												**162**	**162**	**162**	**162**	**162**	**293**	**293**	**293**	**293**	293
NET NEW EARNINGS FROM DIRECT, INDIRECT & INDUCED SPENDING																					
Retail Tenants												$ 18,309	$ 18,859	$ 19,424	$ 20,007	$ 20,607	$ 37,808	$ 38,942	$ 40,110	$ 41,314	255,381
Retail Center Operations												$ 1,016	$ 1,046	$ 1,078	$ 1,110	$ 1,143	$ 1,811	$ 1,848	$ 1,885	$ 1,922	12,858
Indirect & Induced												1,127	1,150	1,173	1,196	1,220	2,008	2,048	2,089	2,131	14,142
Total from Retail Center Operations												$ 2,143	$ 2,196	$ 2,250	$ 2,306	$ 2,363	$ 3,819	$ 3,896	$ 3,974	$ 4,053	27,000
TOTAL NEW EARNINGS												**20,452**	**21,055**	**21,675**	**22,313**	**22,971**	**41,627**	**42,838**	**44,084**	**45,367**	282,381
ESTIMATED FISCAL IMPACT FROM NEW SPENDING																					
GET												1,361	1,402	1,444	1,487	1,532	2,424	2,497	2,572	2,649	17,366
Property Tax												549	560	571	582	594	1,133	1,155	1,179	1,202	7,523
Income Tax												305	314	320	327	333	543	559	571	582	3,855
TOTAL FISCAL IMPACT												**$ 2,214**	**$ 2,275**	**$ 2,335**	**$ 2,396**	**$ 2,459**	**$ 4,100**	**$ 4,212**	**$ 4,321**	**$ 4,433**	28,744

(1) Includes 20% of soft costs and contingency.

OFFICE ECONOMIC IMPACT ANALYSIS

ASSUMPTIONS

Gross Leasable Area (sf)	20,000
General Office	15,000
Medical Office	5,000
Average occupancy rate	95%
Occupied sf	19,000
Base Rental Rate psf/month (2019)	$2.75
Operating Expenses psf/month (2019)	$1.25

OFFICE ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Direct, Indirect & Induced Expenditures

(2019 Dollars, $000s)

	Assumptions		
Direct expenditures from Building Operations			
Total Office			20,000
Average occupancy rate			95%
Occupied sf			19,000
Base Rents	$3.00 psf/mo	$	684,000
Operating Expenses	$1.25 psf/mo		$300
Total Annual Direct Expenditures			**$300**
Indirect and induced expenditures (rounded) (1)			
Maintenance and Repair	$2.05 per $ of direct expenditure		$614
Total indirect and induced expenditures (rounded)		$	614
Total direct, indirect and induced visitor expenditures (rounded)		**$**	**900**

OFFICE ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Direct, Indirect & Induced Earnings/Personal Income

	Assumptions	
Direct employment (FTE persons) (1):		
Office FTEs	1.0 FTE per 150 sf	127
Maintance & Repair FTEs	included in retail	
Total direct, indirect & induced employment (FTE persons) (rounded):		**127**
Direct personal income:		
	Annual Mean Wages	**$58,074**
	Finance & Insurance	$67,630
	Professional, scientific & techncial services	$49,870
	Healthcare Practioners	$98,870
	Healthcare Support	$36,730
Total direct personal income ($000s) (rounded)		$7,360
Total direct personal income ($000s) (rounded):		**$7,360**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

OFFICE ECONOMIC IMPACT ANALYSIS

CONSTRUCTION IMPACT

(2019 Dollars;$000s)

	Assumptions		
Total Building Area (sf) (1)			20,000
Estimated Construction Costs (2019):			
Building construction			
General Office	$300 per square foot	$	4,950
Medical Office	$400 per square foot	$	2,200
Soft Costs	20% of Hard Costs	$	1,430
Total direct expenditures (rounded)			8,580
Indirect and induced expenditures (2)	$2.10 per $ of direct expenditure	$	18,020
Total direct, indirect and induced expenditures (rounded)		**$**	**26,600**
Direct employment (3)			
Building construction	4.4 employees per $million direct expenditure		38
Total direct employment			38
Indirect and induced employment (3)	2.4 employees per $million direct expenditure		20
Total direct, indirect and induced employment(rounded)			**60**
Direct income ($000s) (2)			
Building construction	$68,730 annual mean wage	$	2,605
Total direct income (rounded)			2,600
Indirect and induced income (3)	$1.84 per $ of direct personal income		4,800
Total direct, indirect and induced construction income (rounded)		**$**	**7,400**

(1) Gross building area includes 10% for common areas/circulation. Leasable area is 15,000 sf.

(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Devel and Tourism, August 2016.

OFFICE ECONOMIC IMPACT ANALYSIS

FISCAL IMPACT

ESTIMATED ANNUAL COUNTY REAL PROPERTY TAXES

(2019 Dollars)

	Assumptions	
Gross Leasable Area (sf)		20,000
Estimated real property taxes (rounded):		
Building		$12.90
Land		$12.40
Building	Value equal to construction cost	8,580
Land	assessed value	n/a
Total estimated real property taxes($000s)		**$111**

ESTIMATED STATE REVENUES

(2019 Dollars, $000s)

Revenue Source	Assumptions		
General excise tax (GET):			
On construction expenditures			$43
On operations revenues			32
Total GET			$75
Income taxes:			
Operational (1)	0.0346 per $ direct expenditure	$	255
Construction (2)	0.028 per $ direct expenditure	$	207
Total income taxes		$	462
Summary			
GET			$75
Income taxes			462
Total revenues to the State (rounded)			**$537**

OFFICE ECONOMIC IMPACT ($000s)																					
YEAR	1 2020	2 2021	3 2022	4 2023	5 2024	6 2025	7 2026	8 2027	9 2028	10 2029	11 2030	12 2031	13 2032	14 2033	15 2034	16 2035	17 2036	18 2037	19 2038	20 2039	TOTAL
															Planning & Construction		*Delivery of TOD Site Commercial Building with 20,000 sf of office*				
IMPACT FROM CONSTRUCTION																					
Construction Costs (1)																					
New Materials Spending																$ 10,427					$ 10,427
New Labor Spending																$ 5,614					$ 5,614
Total Construction Costs																**$ 16,041**					**$ 16,041**
Indirect & Induced																33,681					$ 33,681
Total New Spending from Construction																**$ 49,722**					**$ 49,722**
Construction Employment																					
FTEs																38					38
Indirect & Induced Jobs																20					20
Total Employment from Construction																**58**					**58**
Construction Wages																					
New Earnings from Construction																$ 2,600					$ 2,600
Indirect & Induced Wages																4,800					$ 4,800
Tax Revenue																**7,400**					**$ 7,400**
GET																$ 80					$ 80
Income Taxes																207					$ 207
Total Tax Revenue from Construction																**$ 287**					**$ 287**
IMPACT FROM OPERATIONS																					
Operations Revenue																					
Building Operations																	$ 300	$ 309	$ 318	$ 328	$ 1,255
Indirect & Induced																	614	626	639	651	$ 2,530
Total New Spending from Building Operations																	**$ 914**	**$ 935**	**$ 957**	**$ 979**	**$ 3,785**
Operations Employment																					
Office Building Tenants																	127	**127**	**127**	**127**	127
Office Building Operations																	included in retail				-
Indirect & Induced																	included in retail				-
Total FTEs from Operations																	127	127	127	127	127
Operations Wages																					**$ -**
Tenant wages																	$ 11,811	$ 12,165	$ 12,530	$ 12,906	$ 49,411
Indirect & Induced Wages																	-	-	-	-	$ -
Total Wages from Operations																	**$ 11,811**	**$ 12,165**	**$ 12,530**	**$ 12,906**	**$ 49,411**
Tax Revenue																					
GET																	$ 52	$ 53	$ 55	$ 57	$ 216
Property Tax																	178	181	185	188	$ 732
Income Tax																	409	421	433	446	$ 1,709
TOTAL FISCAL IMPACT																	**$ 638**	**$ 655**	**$ 673**	**$ 691**	**$ 2,658**

(1) Includes 20% of soft costs and contingency.

INDUSTRIAL ECONOMIC IMPACT ANALYSIS

ASSUMPTIONS

Industrial Park lands (usable acres)	47.9
Total Building Area (sf) at FAR 0.5	1,043,262
Average occupancy rate	95%
Occupied sf	991,099
Average Base Rent (psf/mo) ($2019)	$1.40
Average Operating Expense (psf/mo)($2019)	$0.36

INDUSTRIAL ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Direct, Indirect & Induced Expenditures

(2019 Dollars, $000s)

	Assumptions		
Direct expenditures from Building Operations			
Total Projected Industrial Space			1,043,262
Average occupancy rate			95%
Occupied sf			991,099
Annual Rental Revenue ($2019)	$1.40 psf/mo	$	16,650
Operating Expenses ($0.36 psf/mo)			$4,282
Total Annual Direct Expenditures			**$4,282**
Indirect and induced expenditures (rounded) (1)			
Maintenance & Repairs	$2.05 per $ of direct expenditure		$8,760
Total indirect and induced expenditures (rounded)		$	8,760
Total direct, indirect and induced expenditures (rounded)			**$13,000**

INDUSTRIAL ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Employment and Wages

Direct employment (FTE persons) (1):

Industrial Tenants	1.0 FTE per 527 sf	1,881
Maintenance and Repair	self-managed/owner occupied	

Direct personal income:

	Annual Mean Wages	**$55,813**
	Construction & Extraction	$68,730
	Installation, Maintenance and Repair	$58,000
	Transportation and Material Moving	$50,530
	Manufacturing	$45,993
Total direct personal income ($000s) (rounded)		$104,965

Indirect and induced personal income($000s)(rounded) (2):

Mining and Construction	$1.77 per $ of direct personal income		
Maintenance and Repair	$1.78 per $ of direct personal income		
Transportation	$2.13 per $ of direct personal income		
Other Manufacturing	$3.18 per $ of direct personal income		
AVERAGE	$2.21 per $ of direct personal income	$	232,313
Total indirect and induced personal income			$232,313
Total direct, indirect and induced personal income ($000s) (rounded):			**$337,277**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

INDUSTRIAL ECONOMIC IMPACT ANALYSIS

CONSTRUCTION IMPACT

(2019 Dollars;$000s)

Total Industrial Building Area (sf) (1)			1,043,262
Estimated Construction Costs (2019):			
Building construction (excludes park infrastructure construction)	$140 per square foot	$	146,057
Soft Costs	20% of hard costs	$	14,606
Total direct expenditures (rounded)		$	160,662
Indirect and induced expenditures (2)	$2.10 per $ of direct expenditure	$	337,350
Total direct, indirect and induced expenditures (rounded)		**$**	**498,000**
EMPLOYMENT			
Direct employment (3)			
Building construction (excludes park infrastructure construction)	4.4 employees per $million direct expenditure		709
Total direct employment			710
Indirect and induced employment (3)	2.4 employees per $million direct expenditure		390
Total direct, indirect and induced employment(rounded)			**1,100**
WAGES			
Direct income ($000s) (2)			
Building construction (excludes park infrastructure construction)	$68,730 annual mean wage	$	48,764
Total direct income (rounded)			48,760
Indirect and induced income (3)	$1.84 per $ of direct income	$	89,930
Total direct, indirect and induced construction income (rounded)		**$**	**138,700**

(1) The analysis reflects the total build out. The project will likely be built in phases over a 5-year period.

(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and To
August 2016.

INDUSTRIAL ECONOMIC IMPACT ANALYSIS

FISCAL IMPACT

ESTIMATED ANNUAL COUNTY REAL PROPERTY TAXES

(2019 Dollars)

	Assumptions	
Industrial Park lands (usable acres)		48
Total Building Area (sf) at FAR 0.5		1,043,262
Estimated real property taxes (rounded):		
Building		$12.90
Land		$12.40
Building	Value equal to construction cost	160,662
Land	assessed value	n/a
Total estimated real property taxes($000s)		**$2,073**

ESTIMATED STATE REVENUES

(2019 Dollars, $000s)

Revenue Source	Assumptions	
General excise tax (GET):		
On rent revenues		$785
On construction expenditures		$803
Total GET		$1,588
Income taxes:		
Operational	0.0346 per $ direct income	$ 3,631
Construction	0.028 per $ direct income	$ 1,365
Total income taxes		$4,996
Summary		
GET		$1,588
Income taxes		4,996
Total revenues to the State (rounded)		**$6,584**

INDUSTRIAL ECONOMIC IMPACT ($000s)																					
YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TOTAL
Acres Absorbed/Leased						*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*0.0*	*4.0*	*4.0*	*4.0*			
Buildings (sf)								*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	*87,120*	-	*87,120*	*87,120*	*87,120*	*1,045,440*
IMPACT FROM CONSTRUCTION																					
Construction Costs (1)																					
New Materials Spending								$ 11,700	$ 12,051	$ 12,413	$ 12,785	$ 13,169	$ 13,564	$ 13,971	$ 14,390	$ 14,822	$ -	$ 15,724	$ 16,196	$ 16,682	$ 167,468
New Labor Spending								$ 6,300	$ 6,489	$ 6,684	$ 6,884	$ 7,091	$ 7,304	$ 7,523	$ 7,748	$ 7,981	$ -	$ 8,467	$ 8,721	$ 8,983	$ 90,175
Total Construction Costs								**$ 18,001**	**$ 18,541**	**$ 19,097**	**$ 19,670**	**$ 20,260**	**$ 20,868**	**$ 21,494**	**$ 22,139**	**$ 22,803**	**$ -**	**$ 24,191**	**$ 24,917**	**$ 25,665**	**$ 257,643**
Indirect & Induced								$ 37,797	$ 38,930	$ 40,098	$ 41,301	$ 42,540	$ 43,817	$ 45,131	$ 46,485	$ 47,880	$ -	$ 50,795	$ 52,319	$ 53,889	$ 540,982
Total New Spending from Construction								**$ 55,797**	**$ 57,471**	**$ 59,195**	**$ 60,971**	**$ 62,800**	**$ 64,684**	**$ 66,625**	**$ 68,623**	**$ 70,682**	**$ -**	**$ 74,987**	**$ 77,236**	**$ 79,553**	**$ 798,626**
Construction Employment																					
FTEs								98	104	110	117	124	131	139	148	157	-	177	187	199	1,690
Indirect & Induced Jobs								43	45	46	47	49	50	52	53	55	-	58	60	62	621
Total Employment from Construction								**141**	**148**	**156**	**164**	**173**	**182**	**191**	**201**	**212**	**-**	**235**	**247**	**261**	**2,311**
Construction Wages																					
New Earnings from Construction								$ 5,008	$ 5,158	$ 5,313	$ 5,473	$ 5,637	$ 5,806	$ 5,980	$ 6,159	$ 6,344	$ -	$ 6,731	$ 6,933	$ 7,141	$ 71,683
Indirect & Induced Wages								9,237	9,514	9,799	10,093	10,396	10,708	11,029	11,360	11,701	-	12,413	12,786	13,169	$ 132,206
Total Wages from Construction								**$ 14,245**	**$ 14,672**	**$ 15,112**	**$ 15,566**	**$ 16,033**	**$ 16,514**	**$ 17,009**	**$ 17,520**	**$ 18,045**	**$ -**	**$ 19,144**	**$ 19,718**	**$ 20,310**	**$ 203,888**
Tax Revenue																					
GET								$ 90	$ 93	$ 95	$ 98	$ 101	$ 104	$ 107	$ 111	$ 114	$ -	$ 121	$ 125	$ 128	**$ 1,288**
Income Taxes								504	519	535	551	567	584	602	620	638	-	677	698	719	**$ 7,214**
Total Tax Revenue from Construction								**$ 594**	**$ 612**	**$ 630**	**$ 649**	**$ 669**	**$ 689**	**$ 709**	**$ 731**	**$ 752**	**$ -**	**$ 798**	**$ 822**	**$ 847**	**$ 8,502**
IMPACT FROM OPERATIONS																					
Operations Revenue																					
Building Operations									$ 278	$ 564	$ 858	$ 1,162	$ 1,474	$ 1,796	$ 2,128	$ 2,470	$ 2,821	$ 2,821	$ 3,195	$ 3,579	$ 23,147
Indirect & Induced									585	1,188	1,809	2,449	3,107	3,786	4,485	5,204	5,946	5,946	6,732	7,542	$ 48,779
Total New Spending from Building Operations									**$ 863**	**$ 1,752**	**$ 2,667**	**$ 3,610**	**$ 4,582**	**$ 5,582**	**$ 6,613**	**$ 7,674**	**$ 8,767**	**$ 8,767**	**$ 9,927**	**$ 11,122**	**$ 71,926**
Operations Employment																					
Building Tenants									165	331	496	661	827	992	1,157	1,323	1,488	1,488	1,653	1,818	1,818
Building Operations									property manager												0
Indirect & Induced									n/a												0
Total FTEs from Operations									165	331	496	661	827	992	1,157	1,323	1,488	1,488	1,653	1,818	12,398
Operations Wages																					
Tenant wages									$ 11,688	$ 24,077	$ 37,200	$ 51,088	$ 65,775	$ 81,298	$ 97,693	$ 114,999	$ 133,255	$ 137,253	$ 157,078	$ 177,969	$ 1,089,373
Indirect & Induced Wages									25,869	53,289	82,332	113,069	145,576	179,932	216,218	254,520	294,925	303,773	347,651	393,889	2,411,042
Total Wages from Operations									**$ 37,557**	**$ 77,367**	**$ 119,531**	**$ 164,156**	**$ 211,351**	**$ 261,230**	**$ 313,912**	**$ 369,519**	**$ 428,180**	**$ 441,025**	**$ 504,729**	**$ 571,858**	**$ 3,500,415**
Tax Revenue																					
GET									$ 116	$ 236	$ 359	$ 486	$ 617	$ 752	$ 890	$ 1,033	$ 1,180	$ 1,180	$ 1,337	$ 1,497	$ 9,684
Property Tax									219	445	678	917	1,164	1,418	1,680	1,950	2,227	2,227	2,522	2,825	18,273
Income Tax									404	833	1,287	1,767	2,275	2,812	3,379	3,978	4,609	4,747	5,433	6,156	37680.8721
TOTAL FISCAL IMPACT									**$ 740**	**$ 1,514**	**$ 2,324**	**$ 3,170**	**$ 4,056**	**$ 4,982**	**$ 5,949**	**$ 6,961**	**$ 8,017**	**$ 8,155**	**$ 9,292**	**$ 10,479**	**$ 65,638**

(1) Includes 20% of soft costs and contingency.

HOTEL ECONOMIC IMPACT ANALYSIS

ASSUMPTIONS

New Visitor Units		180
Average occupancy rate		85%
Average Daily Rate (ADR)		$210
Estimated Annual Revenue ($000's)		$11,727
Estimated Operating Expenses ($000's)	60% of Revenues	$7,036

HOTEL ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Direct, Indirect & Induced Expenditures

(2019)

ASSUMPTIONS		
New Visitor Units		180
Average occupancy rate		85%
Average Daily Rate (ADR)		$210
Estimated Annual Revenue ($000's)		$11,727
Estimated Operating Expenses ($000's)	60% of Revenue	$7,036
Direct Operational Expenditures:		
Total		**$7,036**
Indirect and induced expenditures (rounded) (1)		
Maintenance & Repairs	$2.05 per $ of direct expenditure	$14,397
Total indirect and induced expenditures (rounded)		$ 14,397
Total direct, indirect and induced expenditures (rounded)		**$21,400**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

HOTEL ECONOMIC IMPACT ANALYSIS

OPERATIONAL IMPACT: Employment and Wages

	Assumptions	
Direct employment:		
Operational employment -		
New Visitor Units		180
Full-time equivalent employees per unit		0.50
Total estimated full-time equivalent (FTE)		90
Total direct employment (rounded)		90
Indirect and induced operational employment (rounded) (1):		
Accommodations	2.33 employees per $ million of operational income	16
Total indirect and induced operational employees		16
Total direct, indirect and induced FTE employment (rounded)		**110**
Direct income ($000's) (2)		
Hotel Operations	$39,990 annual mean wage	$ 3,599
Total direct income (rounded)		3,600
Indirect and induced income (1)		
Accommondations	$2.08 per $ of direct income	7,470
Total direct, indirect and induced construction income (rounded)		**$ 11,100**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

(2) Source: Hawaii Workforce Infonet 2018 Data Table for State of Hawaii. Average wages for Building and Grounds Cleaning & Maintenance and Hotel, Motel and Resort Desk Operators.

HOTEL ECONOMIC IMPACT ANALYSIS

CONSTRUCTION MPACT

(2019 Dollars;$000s)

	Assumptions	
Units constructed:		
New unit construction		180
Total units constructed (rounded)		180
Average expenditure per unit ($000's) (1):		
New unit construction	$330,000 per new unit	$ 330
Direct expenditure ($000's)		
New unit construction		$ 59,400
Total direct expenditures (rounded)		59,400
Indirect and induced expenditures (2)	$2.10 per $ of direct expenditure	124,724
Total direct, indirect and induced expenditures (rounded)		**$ 184,100**
Direct employment (2)		
New unit construction	4.4 employees per $million direct expenditure	262
Total direct employment (rounded)		260
Indirect and induced employment (2)	2.4 employees per $million direct expenditure	140
Total direct, indirect and induced employment(rounded)		**400**
Direct income ($000's) (3)		
New unit construction	$68,730 annual mean wage	$ 17,870
Total direct income (rounded)		$ 17,870
Indirect and induced income (2)	$1.84 per $ of direct income	$ 32,960
Total direct, indirect and induced construction income (rounded)		**$ 50,800**

(1) General construction cost benchmark for limited service hotel.
(2) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

(3) Based on Bureau of Labor Statistics, May 2018 State Occupational Employment and Wage Estimates for Hawaii - Construction and Extraction Occupations

HOTEL ECONOMIC IMPACT ANALYSIS

FISCAL IMPACT

ESTIMATED ANNUAL COUNTY REAL PROPERTY TAXES

(2019 Dollars)

	Assumptions	
Number of units		180
Estimated real property taxes (rounded):		
Building		$12.90
Land	DLNR exempt from RPT	$12.40
Building	Value equal to construction cost	59,400
Land	DLNR exempt from RPT	n/a
Total estimated real property taxes($000's)		**$766**

ESTIMATED STATE REVENUES

(2019 Dollars, $000's)

Revenue Source	Assumptions	
General excise tax (GET):		
On construction expenditures		$921
Total GET		$921
Transient accommodations taxes (TAT):		
Total	10.25% of Gross Room Revenues	$1,202
Income taxes (1):		
Operational	0.0346 per $ direct expenditure	$ 618
Construction	0.028 per $ direct expenditure	$ 500
Total income taxes		$1,118
Summary		
GET		$921
TAT		1,202
Income taxes		1,118
Total revenues to the State (rounded)		**$3,241**

(1) Based on final-demand industry multipliers from the "Hawaii State Input-Output Study - 2012 Benchmark Report," by Department of Business, Economic Development and Tourism, August 2016.

HOTEL ECONOMIC IMPACT ($000s)																					
YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TOTAL
												180 room hotel delivered									
										Planning & Construction											
IMPACT FROM CONSTRUCTION																					
Construction Costs (1)																					
New Materials Spending											$ 62,266										$ 62,266
New Labor Spending											33,528										33,528
Total Construction Costs											**$ 95,794**										95,794
Indirect & Induced Spending											201,143										201,143
Total New Spending from Construction											**$ 296,937**										**$ 296,937**
Construction Employment																					
New FTE jobs from Construction											262										262
Indirect & Induced											140										140
Total from Construction											402										402
Construction Wages																					
New Earnings from Construction											$ 24,016										$ 24,016
Indirect & Induced											44,295										44,295
Total from Construction											$ 68,311										$ 68,311
Tax Revenue																					
GET											$ 479										**479**
Income Taxes											$ 904										**904**
Total Tax Revenue from Construction											**$ 1,383**										**1,383**
IMPACT FROM OPERATIONS																					
Operations Revenue																					
Direct Expenditures from Hotel Operations												$ 9,740	$ 10,032	$ 10,333	$ 10,643	$ 10,963	$ 11,291	$ 11,630	$ 11,979	$ 12,338	98,951
Indirect & Induced												19,928	20,526	21,142	21,776	22,429	23,102	23,795	24,509	25,244	202,453
Total from Hotel Operations												29,668	30,558	31,475	32,419	33,392	34,394	35,426	36,488	37,583	301,404
Operations Employment																					
New FTE Jobs from Hotel Operations												90	90	90	90	90	90	90	90	90	90
Indirect & Induced												16	16	16	16	16	16	16	16	16	16
Total from Hotel Operations												106	106	106	106	106	106	106	106	106	954
Operations Wages																					
New Earnings from Hotel Operations												4,983	$ 5,083	$ 5,185	$ 5,288	$ 5,394	$ 5,502	$ 5,612	$ 5,724	$ 5,839	48,610
Indirect & Induced												10,340	10,547	10,758	10,973	11,193	11,416	11,645	11,878	12,115	100,865
Total from Hotel Operations												$ 15,323	$ 15,630	$ 15,943	$ 16,261	$ 16,587	$ 16,918	$ 17,257	$ 17,602	$ 17,954	$ 149,475
Tax Revenue																					
TAT												$ 1,202	$ 1,226	$ 1,251	$ 1,276	$ 1,301	$ 1,327	$ 1,354	$ 1,381	$ 1,408	$ 11,726
GET												601	613	625	638	651	664	677	690	704	5,863
Property Tax												530	546	557	568	580	591	603	615	627	5,219
Income Tax												309	318	328	338	348	358	369	380	392	3,140
Total Tax Revenue from Construction												**$ 839**	**$ 865**	**$ 885**	**$ 906**	**$ 928**	**$ 950**	**$ 972**	**$ 995**	**$ 1,019**	**8,359**

(1) Includes 20% of soft costs and contingency.