



# Waikīkī Beach Management Plan

*May 30, 2018*



**Waikīkī Beach Special Improvement District Association**  
in Partnership with the  
University of Hawai‘i Sea Grant College Program



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## **Waikiki Beach Special Improvement District Association Mission Statement**

*The Waikiki Beach Special Improvement District is dedicated to enhancing the quality of life in Waikiki, which shall exemplify the quality of life throughout the State of Hawaii, by ensuring the coordinated management and long-term sustainability of Waikiki Beach. The Waikiki Beach Special Improvement District shall work in partnership with government and the private sector to develop and implement programs that promote the overall vitality of Waikiki Beach and the State of Hawai'i by strengthening their roles on behalf of all residents of Hawai'i and as a world-class resort destination area for visitors.*



### **ACKNOWLEDGMENTS:**

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## **ABSTRACT**

*The Waikīkī Beach Special Improvement District Association (WBSIDA) has developed strategies for a Beach Management Plan for Waikīkī in partnership with the University of Hawai‘i Sea Grant College Program (Hawaii Sea Grant). For the purposes of this project, Waikīkī Beach is defined as the beaches and near shore coastal zone extending from the Kapahulu Groin to Hilton Hawaiian Village Beach including the waters of the Ala Wai Canal. The primary purpose of this management plan is to identify, assess and prioritize beach management assets, issues and projects in Waikīkī for future beach maintenance and to facilitate potential funding sources and partnerships for implementation of these projects. A specific implementation component identified in this plan allows the WBSIDA Board and project manager to support and facilitate the implementation of the plan goals and objectives.*

## **Executive Summary**

### *Waikīkī Beach Management District*

The Waikīkī Beach Special Improvement District Association (WBSIDA) in partnership with Hawai‘i Sea Grant is supporting/leading the Waikīkī Beach Management Plan (Plan). The Plan serves as an overarching framework for the development, evaluation and implementation of a technical beach management alternatives for Waikīkī. The WBMP supports innovative, science-based beach management plans in Waikīkī including the development and implementation of a dynamic and ongoing community planning and visioning process through the WBSIDA and the Waikīkī Beach coordinator.

The Waikīkī Beach Improvement District was created in 2015 through the Waikīkī Beach Special Improvement District Association (WBSIDA). Waikīkī Beach Special Improvement District #3 (the WBSIDA District) includes all the commercial properties of Waikīkī, bounded by Kapahulu Avenue, the Ala Wai Canal and the Ala Wai Harbor (Appendix A). The WBSIDA strives to support beach management and maintenance projects in Waikīkī through providing support and coordination of the Waikīkī Beach Management Plan (WBMP) and related beach maintenance projects in Waikiki. The WBSIDA serves as the coordinating organization for the evaluation, development and implementation of beach, nearshore and water quality improvement projects in Waikīkī. The WBSIDA is intended to serve as the conduit for project funding, stakeholder engagement and stakeholder input and oversight of proposed projects in close coordination with the State of Hawai‘i and the City and County of Honolulu as project partners. The WBSIDA serves as a collaborative public-private partnership (P3) funding mechanism, in partnership with the state, for priority beach improvement projects identified through this beach management plan.

The Waikīkī Beach Special Improvement District Association has taken the lead on facilitating, coordinating and supporting key projects in Waikīkī. The Waikīkī Beach Management Plan identifies site-specific strategies to support the goals of the Waikīkī Beach Management District and community. The WBSIDA provides a unique funding mechanism for Waikīkī beach planning, research and scientific studies in addition to project support, management and coordination of beach maintenance and improvement projects in Waikīkī and the Ala Wai Canal. The WBSIDA leadership, coordination and cost share for future projects plays an important part in the ability of State and local partners to secure funding for ongoing and new beach improvement projects in Waikīkī. The Waikīkī Beach Management Plan provides a clear management strategy and prioritized projects list that have been vetted through a community advisory committee to ensure the projects meet the goals and expectations of the Waikīkī community.



## PROJECT GOALS AND OBJECTIVES

### Ho'omau 'O Waikīkī Kahakai (Waikīkī Beach Renews Itself)

The primary goal of the Waikīkī Beach Management Plan is to improve the quality and sustainability and stability of the public beach and nearshore resources along Waikīkī Beach. The Project is part of a broader environmental initiative, the *Ho'omau 'O Waikīkī Kahakai* (HOW) which translates to (Waikīkī Beach renews itself). Project strategies include development of a beach management improvement projects, support of studies for new shoreline structures, near shore and Ala Wai Canal water-quality studies and improvements and other related beach management endeavors. These projects are structured in coordination with the Department of Land and Natural Resources, the Waikīkī Beach Special Improvement District Association (WBSIDA), the City and County of Honolulu and the University of Hawai'i Sea Grant College Program (Hawai'i Sea Grant). The *Ho'omau 'O Waikīkī Kahakai* initiative serves as a guiding principle for the community visioning process for Waikiki Beach and includes development of several preliminary project strategies:

1. A community-based beach management and maintenance plan
2. Economic study update of the value of Waikīkī Beach
3. Stakeholder perception surveys of Waikiki Beach
4. Coastal and nearshore natural resource valuation model
5. Beach profile surveying and sediment budget
6. Beach profile research video analysis
7. Nearshore beach sediment source assessment
8. Study and assessment of conceptual designs for new shoreline structures
9. Nearshore and Ala Wai Canal water quality monitoring and improvements
10. Assessment of climate change impacts including Waikīkī groundwater inundation.
11. and many other related endeavors.

These supporting efforts will be carried out in coordination with the project partners and stakeholders. Strategic outreach efforts and visioning process will help define the primary project priorities and strategies and create the framework for a comprehensive plan for Waikiki's future. The WBSIDA has developed a [Waikīkī Beach Community Advisory Committee](#) (WBCAC) to help inform project development, serving as a community representative to the project team.

## PRIORITY MANAGEMENT ISSUES AND PROJECTS

### Waikīkī Beach Community Advisory Committee

The WBSIDA hosted a Waikīkī Community Advisory Committee (WBCAC) meeting on March 20, 2018. One of the main goals of the meeting was to identify highest priority beach management issues and list potential solutions. The results of this meeting are summarized in Section. VIII. Management Plan Outcomes as well as the full-results in Appendix D. This meeting included a series of exercises including a simple vote for what beach areas are the highest priority for each committee member for developing plans for beach management, maintenance and/or improvements. The WBCAC also identified priority assets, problems and solutions for Waikīkī Beach that are helpful for developing plans and projects that address the priorities of the Waikīkī community. The priority projects for Waikīkī Beach included in this plan are consistent with the outcomes of the WBCAC.

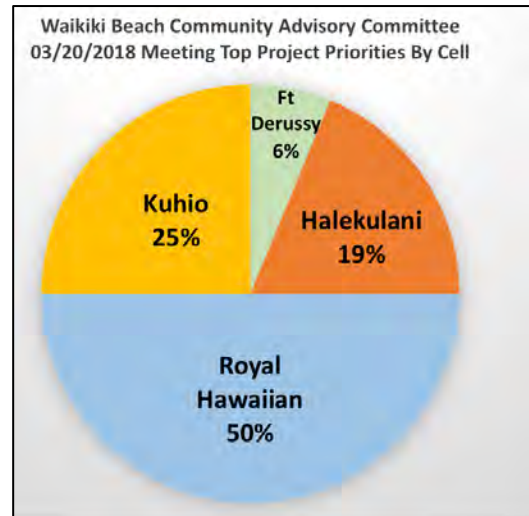


Figure 1. WBCAC March, 2018 beach project priorities.

#### PRIORITY AREAS

- The Royal Hawaiian Cell was considered the #1 choice for beach management planning and maintenance (50%), followed by Kuhio Beach (25%) and Halekulani (19%)

#### PRIORITY ASSET

- The top asset identified for Waikīkī included the general economic value provided by the beach but it is recognized how closely connected and inter-related each value (Economic, aesthetic, recreational, historic, etc..) is to each other.

#### PRIORITY PROBLEM

- The top problem identified for Waikīkī varied greatly by cell but tended included Erosion/wave run-up and Structural Damage.

#### PRIORITY SOLUTION

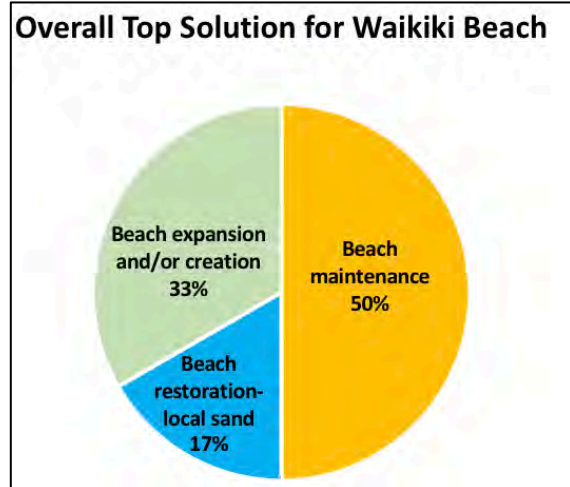
- The top solution identified for Waikīkī varied by cell but included beach maintenance and beach restoration using local sand sources with specific “other” options.

**Waikiki Beach Community Advisory Committee  
Problem Mapping and Response Exercise (3-20-2018)**

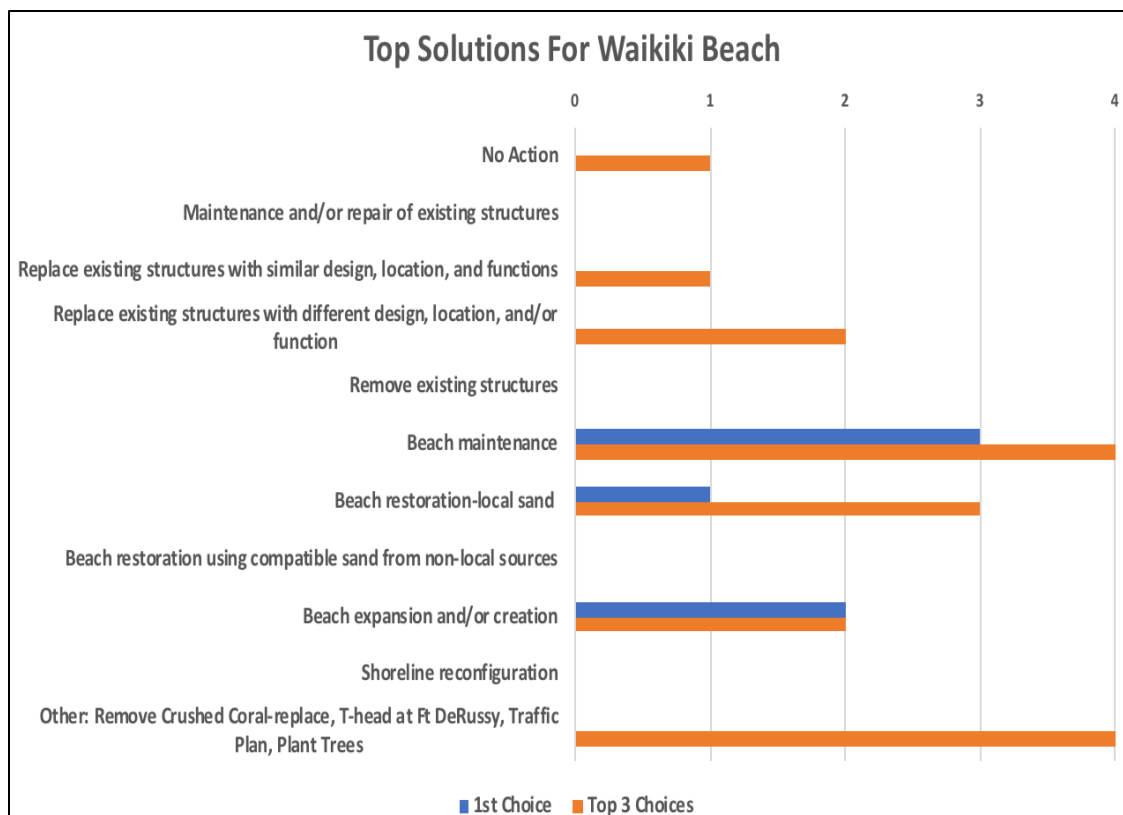
Goal: Identify highest priority beach management issues and rank potential solutions.  
The results for each cell are summarized in Appendix D and more generally below.

**General Summary:** Overall the results suggest the following:

1. Preferred solutions vary by each beach cell but tend to generally favor the softer maintenance-oriented solutions.
2. Looking just at the 1<sup>st</sup> choice solutions, beach maintenance is favored followed by beach expansion and beach restoration.
3. Generally, the *most favored overall* solutions included beach maintenance and beach restoration using local sand sources with specific “other” options that vary by cell.
4. Water quality concerns were identified as a top problem for Kuhio Beach.



**Figure 2.** First choice solutions for Waikiki Beach.

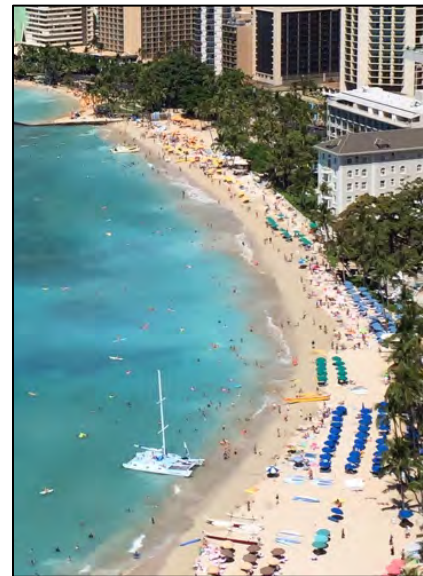


**Figure 3.** Top 3 ranked choices for solutions for Waikiki Beach.

## INTRODUCTION AND BACKGROUND

Waikīkī Beach is a globally recognized icon of Hawai‘i and is the state’s largest tourist destination. Waikīkī generates approximately 42% of the state’s visitor industry revenue and is responsible for 8% (\$5 billion) of the Gross State Product<sup>1</sup>. Beaches are a primary attraction for visitors to Waikīkī. It has been estimated that Waikīkī Beach accounts for several billion in annual income for the local economy<sup>2</sup>. However, a recent survey found that 12% of visitors would not return to Waikīkī due, in part, to limited beach area and resulting overcrowding<sup>2</sup>. Waikīkī Beach also has tremendous cultural significance as a former playground of Hawaiian royalty and the birthplace of the sport and culture of surfing. The beaches and myriad of world-renowned surf breaks and reef ecosystem located offshore are valuable natural resources that support the culture and lifestyle of Hawai‘i, and the idyllic image of Waikīkī.

A variety of factors are contributing to beach narrowing along the Waikīkī shoreline. In natural settings, beaches are highly ephemeral environments, continuously evolving with changing waves, tides, currents, sediment supply, and sea level. Waikīkī is a highly developed urban beach with a long history of coastal engineering projects including beach nourishment, and shoreline structures such as groins and seawalls. Hardened shoreline structures dominate Waikīkī’s beach dynamics by altering sediment transport dynamics, thereby influencing beach location and width. Historical sand hauling from the beach and dredging/mining of the reef in Waikīkī during the early 20<sup>th</sup> century also significantly altered coastal dynamics in the region. Therefore, in order to better protect and manage the beach resources in Waikīkī it is important to fully understand the cumulative effects of the shoreline structures, human activities, and coastal processes (natural and human-induced) that control the movement of sand in the littoral system.



Waikīkī Beach consists of primarily medium-coarse grain calcareous beach sand interspersed with larger-diameter coral cobble (Sea Engineering Inc., 2009). The origins of beach sand in Waikīkī vary widely and are not well documented but much of the beach sand in Waikīkī was imported from various sources (Table 1). The beaches of Waikīkī experience seasonal fluctuations in beach width and height due to seasonal variations in wave energy. During large wave events a strong offshore rip current pulls sand out of the channels in the reefs including the ‘Āpuakehau Stream Channel in the Royal Hawaiian beach cell (Figure 4). If sand is transported far enough offshore and into deeper water it becomes unavailable to the beach system, as waves and currents will no longer be able to return the sand to the beach. From 1985 to 2009, the primary trend has been shoreline recession, with the shoreline retreating at rates up to 2.4 feet per year, and an average annual rate of 1.5 feet (Sea Engineering, Inc., 2009).

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<sup>1</sup> <http://www.waikikibid.org/>

<sup>2</sup> Waikīkī Improvement Association (2008) *Economic Impact Analysis of the Potential Erosion of Waikīkī Beach, Final Report*.  
Waikīkī Beach Management Plan-May, 2018



The beach systems in Waikīkī have been studied in great detail<sup>3,4,5</sup>. However relatively few stable resources are available to support ongoing beach improvements and maintenance on a planned schedule. Numerous engineering projects have been proposed to improve the beach resources at Waikīkī<sup>6,7</sup>. None however fit into a broader community-based plan for Waikīkī, thus pointing to the need for a comprehensive management plan that can contextualize and prioritize future projects. Without an overarching management district plan, past engineering and beach maintenance projects have consisted of independent and often reactionary ad hoc projects with little or no consideration of how the project ties in with other longer-term needs and plans in Waikīkī. This beach management plan will help to provide recommendations toward prioritizing beach management projects in Waikīkī that are connected to and supported by the community and stakeholder sentiment.

## THE PROBLEM

Waikīkī Beach is a highly engineered urban shoreline with the modern configuration largely the result of past engineering efforts (e.g., groins, seawall, and sand fill) intended to widen the beach<sup>8</sup>. Due to ongoing chronic and episodic beach erosion, lack of coordinated management, and lack of capital investment, many sections of Waikīkī Beach are substantially narrowed or completely lost to erosion (Appendix 1). Beach loss results in a variety of negative economic, social, cultural, and environmental impacts. These impacts highlight the need for sustained long-term capital investment and comprehensive beach management in Waikīkī Beach to maintain its unique economic, social, cultural, recreational, environmental, and historical qualities. Waikīkī Beach presents a wide range of management challenges.



**Figure 4: Waikīkī Littoral Cells.**

<sup>3</sup> Miller, T. L. and Fletcher, C.H. (2003) *Waikiki: Historical Analysis of an Engineered Shoreline*. Journal of Coastal Research. V.19.4.

<sup>4</sup> Wiegel, R.L. (2008) *Waikiki Beach, Oahu, Hawai'i : History of its Transformation from a Natural to an Urban Shore*. Shore & Beach, V.76-2.

<sup>5</sup> <http://www.soest.hawaii.edu/coasts/erosion/oahu/>

<sup>6</sup> Noda (1991) *Coastal Processes and Conceptual Design Considerations for Waikiki Beach Improvements*. Waikiki Beach Improvement Project. Prepared for the State of Hawaii Dept. of Transportation, Harbors Div. Report No. EKN-121-R-5-1.

<sup>7</sup> Bodge, K.R. (2000) *Independent Evaluation of Study of Proposed Kuhio Beach Improvements*. Prepared for State of Hawaii Dept of Land and Natural Resources, Land Div.

<sup>8</sup> Miller, T. L. and Fletcher, C.H. (2003) *Waikiki: Historical Analysis of an Engineered Shoreline*. Journal of Coastal Research. V.19.4..

## HISTORICAL PROJECTS

### Historical Coastal Engineering and Beach Replenishment in Waikīkī

Waikīkī Beach has undergone significant changes since the turn of the century. Waikīkī is a highly developed urban beach with a long history of coastal engineering projects including beach nourishment, and shoreline structures such as groins and seawalls. Hardened shoreline structures dominate Waikīkī's beach dynamics by altering sediment transport dynamics, thereby influencing beach location and width. Historical sand hauling from the beach and dredging/mining of the reef in Waikīkī during the early 20<sup>th</sup> century also significantly altered coastal dynamics in the region.

The historical context of Waikīkī reveals a significantly altered landscape. What was once wetland and Taro Loi (a submerged water-base farming technique similar to rice paddies) were drained through the construction of the Ala Wai Canal in the early 1920's (Figure 5). This wetland drainage, along with massive coral reef and sand dredging throughout Waikīkī was followed by rapid coastal development. This had a dramatic impact on the Waikīkī environment, forever changing these unique coastal ecosystems. As a result of the nearshore reef dredging, coastal erosion accelerated resulting in a proliferation of shoreline structures around the turn of the century and into the 1950s, some of these structures are still there today and serve as a stark reminder of the consequences of unplanned or poorly coordinated projects.



Figure 5. Historical stream and wetlands located in Waikīkī. Image: Ho'okuleana, LLC.





**Figure 6.** Examples of beach erosion, Inundation and structural failure in Waikīkī.

Historical shoreline studies by the University of Hawai‘i<sup>9</sup> have revealed that the distribution of alongshore shoreline change trends in Waikīkī is largely related to the location of groins and other shoreline structures (Appendix B). These shore-perpendicular structures interrupt the natural long-shore sediment transport, typically resulting in beach accretion against the updrift side of a structure and erosion at the downdrift side (Figure 6). Due largely to localized effects of shoreline structures, beaches have been completely lost to erosion at the Diamond Head (east) end of Kaimana Beach, on the Ewa (west) side of the Natatorium at Kapiolani Beach, and at the Diamond Head end of Gray’s Beach fronting the Sheraton Waikīkī and Halekulani Beach. In addition to unintended negative impacts to coastal sediment transport processes, many of the shoreline structures in Waikīkī are not engineered to modern standards and are in threat of failure<sup>10</sup>.

<sup>9</sup> <http://www.soest.Hawai‘i.edu/coasts/erosion/>

<sup>10</sup> The Royal Hawai‘ian Groin, a critical terminal groin and one of the more essential shoreline stabilizing structures in Waikīkī, in 2018 is showing severe signs of toe failure and potential collapse. This necessitated emergency sandbag repairs by the state in December, 2012. This groin was built in 1927.

## THE UNIQUE BEACH MANAGEMENT SETTING OF WAIKĪKĪ

The Waikīkī Beach Management Plan provides guidelines for a sustainable management approach to the greater Waikīkī Beach region. Waikīkī Beach consists of seven littoral cells<sup>11</sup> that extend from Kaimana Beach to Fort DeRussy, the boundaries of which are largely defined by groins and other artificial structures (Figures 4 & 7). The littoral cells represent beach management sub-zones within the larger Waikīkī Beach area. Each cell has unique features that control sediment transport and beach dynamics, and the feasibility of various beach management strategies varies from cell to cell. One of the benefits of a cell-based system is that beach maintenance work may be scheduled or phased over time and does not need to address the entire stretch of Waikīkī in one massive project. However, larger projects are generally more cost effective due to the economies of scale to be gained, especially with respect to offshore sand reclamation. The timing and funding of beach improvement projects will depend largely on the prioritization of beach maintenance activities in Waikīkī.



**Figure 7.** Waikīkī Beach supports a wide variety of ocean recreation opportunities and requires regular maintenance to sustain these recreational resources.

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<sup>11</sup> A *littoral cell* is a section of coast that is isolated by features that prohibit the transport of sediment to adjacent sections of coast.  
Waikīkī Beach Management Plan-May, 2018



## Why Now?

Strong interest has been expressed by government and the private sector to develop immediate and long-term options for beach management in Waikīkī. The WBMP identifies potential opportunities to leverage existing cooperative stakeholder relationships, while drawing from experience and lessons learned from past beach improvement Projects<sup>12</sup>. The 2012 project was successful in offshore recovery and placement of nearshore sand along Waikīkī Beach between Kūhiō and the Royal Hawaiian beach, resulting in an average increase in beach width of 37 feet (Figure 8). This project has reignited interest in beach maintenance using nearshore sand resources. The [2012 Waikīkī Beach Maintenance](#) project succeeded largely through public-private partnerships involving beachfront hotels at Waikīkī, DLNR, UH Sea Grant, and other stakeholders including Kyo Ya Hotels and Resorts. These positive working relationships are strongly supported and being sustained through the WBSIDA to address the ongoing maintenance needs of the greater Waikīkī Beach area. The local visitor economy is undergoing a strong recovery with record setting occupancy and revenue since 2012 that is expected to continue.



**Figure 8:** Beach nourishment at Kūhiō Beach, 2012.

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<sup>12</sup> The DLNR Office of Conservation and Coastal Lands prepared a paper to document the experiences and lessons learned through the 2012 Waikiki Beach Maintenance project, including an evaluation of the management and outreach aspects of the project. <http://dlnr.hawaii.gov/occl/files/2013/08/2012-Waikiki-Beach-Maintenance-Final-Report.pdf>

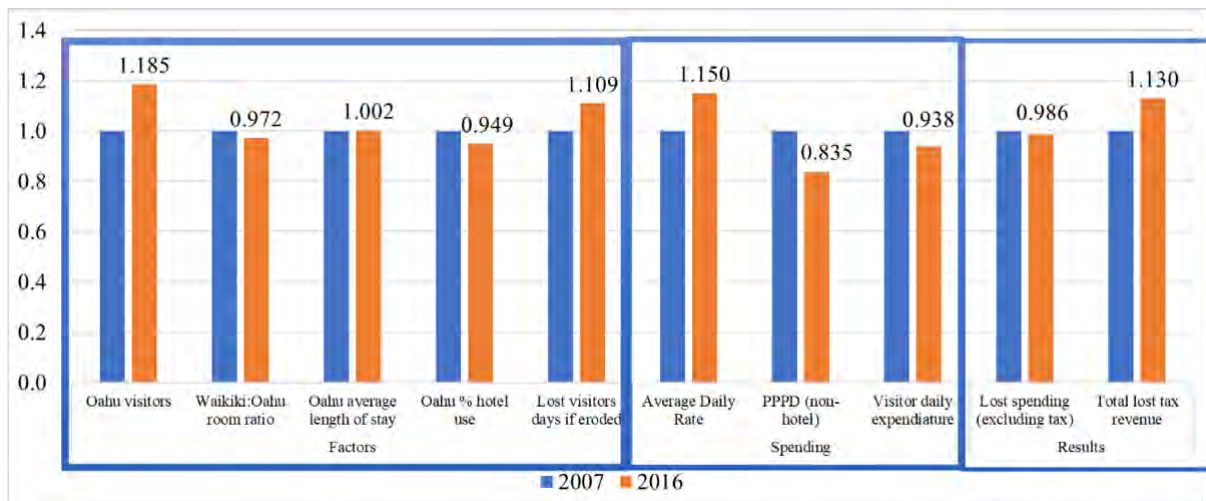


## Waikīkī Beach Economic Valuation Study Update

This 2018 update provides an update to a 2008 report on the value of Waikīkī Beach using 2016 economic and visitor arrival data. Hospitality Advisor’s 2008<sup>13</sup> report concludes that just under \$2 billion (2007 U.S. dollars) in overall visitor expenditures could be lost annually due to a complete erosion of Waikīkī Beach. The 2008 report investigated the economic impact of the erosion of Waikīkī Beach through visitor surveys and analysis of state visitor arrival data. The 2018 report updates the economic impact estimates with the most recent set of complete tourism data available for 2016 (Figure 9). The estimated potential loss in spending and revenue increased slightly to \$2.22 billion in 2016 (about a 1.4% decrease from 2007 after adjustment for inflation). While the total number of O’ahu visitors increased by 18.5% between 2007 and 2016, the rate of change differs among visitors from different parts of the world, whose spending patterns and propensity to visit Waikīkī upon beach erosion varies. The average daily rate for hotel accommodation increased by 15.0%, but the average daily expenditure per visitor decreased by 6.2% between 2007 and 2016 (daily expenditures outside hotels decreased by more than 16%). O’ahu, in particular, has many new visitors, but on average these visitors spend less than the visitors to the neighbor islands do. These factors together explain the 1.4% reduction in the estimated economic impact of the erosion of Waikīkī Beach between 2007 and 2016 when adjusted for inflation.

### Based on 2016 visitor data:

- With complete beach erosion, Waikiki room demand declines by about 2.9 million nights
- \$674 million in lost hotel room revenue
- \$830 million in lost total hotel revenue if services such as food and beverage, spa, etc. are included
- \$2.2 billion in overall visitor expenditure lost—1.4% lower than the 2008 estimate (after adjustment for inflation)



**Figure 9.** Change in visitor statistics between 2007 and 2016 (in 2016 dollars).

<sup>13</sup> Hospitality Advisors, LLC. (2008). Economic Impact Analysis of the Potential Erosion of Waikīkī Beach. Final Report prepared for Waikīkī Improvement Association. Waikīkī Beach Management Plan-May, 2018

## PRIORITY MANAGEMENT STRATEGIES

### Beach Maintenance

Beach maintenance was the overall most favored solution to erosion problems in Waikīkī from a March, 2018 Waikīkī Community Advisory Committee (Figure 2). The Committee defined beach maintenance as the process of managing and maintaining the current beach conditions without expansion beyond a recent historical limit or standard. The beach maintenance approach provides for the possibility of additional sand but differs from more extensive beach expansion projects that attempt to create a wider or more extensive beach area than has been present in recent history.

Beach maintenance, nourishment or restoration has been the primary method used to maintain significant beach widths in Waikīkī. Beach restoration has been the preferred option for maintaining usable beach widths. Past nourishments have significantly slowed erosion rates as a result of some large-scale inputs of sediment (Table 1). Replenishment projects have been ongoing since the early 1900's; bringing in an estimated volume of over 300,000 yd<sup>3</sup> from various sources since 1939. The most recent took place in 2012 along the 1,700 ft section fronting the Moana Surfrider and Royal Hawaiian hotels.

The 2012 Waikīkī Beach Maintenance project in the Royal Hawai'i beach cell is a good example of this approach. As part of the 2012 project, approximately 27,000 yds<sup>3</sup> of sand was placed along this section of beach to restore sections of eroded beach (Figure 8). The project increased the beach width by an average of 37 ft using pumped sand from a nearshore sand source that was recovered from deposits located approximately 2,000 ft offshore (Figure 10). In addition to sand replenishment, two deteriorated (1950s era) concrete filled sandbag groins were removed from the eastern section of the project area.

Year	Location	Volume (yd <sup>3</sup> )
1939	Kuhio Beach	7,000
1951-1957	Kuhio/Queens & Kapiolani Beach	130,000 - 160,000
1959	Kuhio Beach	19,000
1965	Outrigger Canoe Club	6,000
1970	Fort DeRussy Beach	82,000
1972	Kuhio Beach	12,000
1975	Fort DeRussy Beach	16,000
2003	Kuhio Beach	1,400
2007	Kuhio Beach	10,000
2012	Waikīkī Beach (Royal Hawaiian- Moana)	27,000
<b>TOTAL</b>		<b>307,000 – 337,400</b>

**Table 1:** History of Beach Nourishment in Waikīkī. Adapted from 2012 Waikīkī Beach Maintenance Final Report. June, 2013.

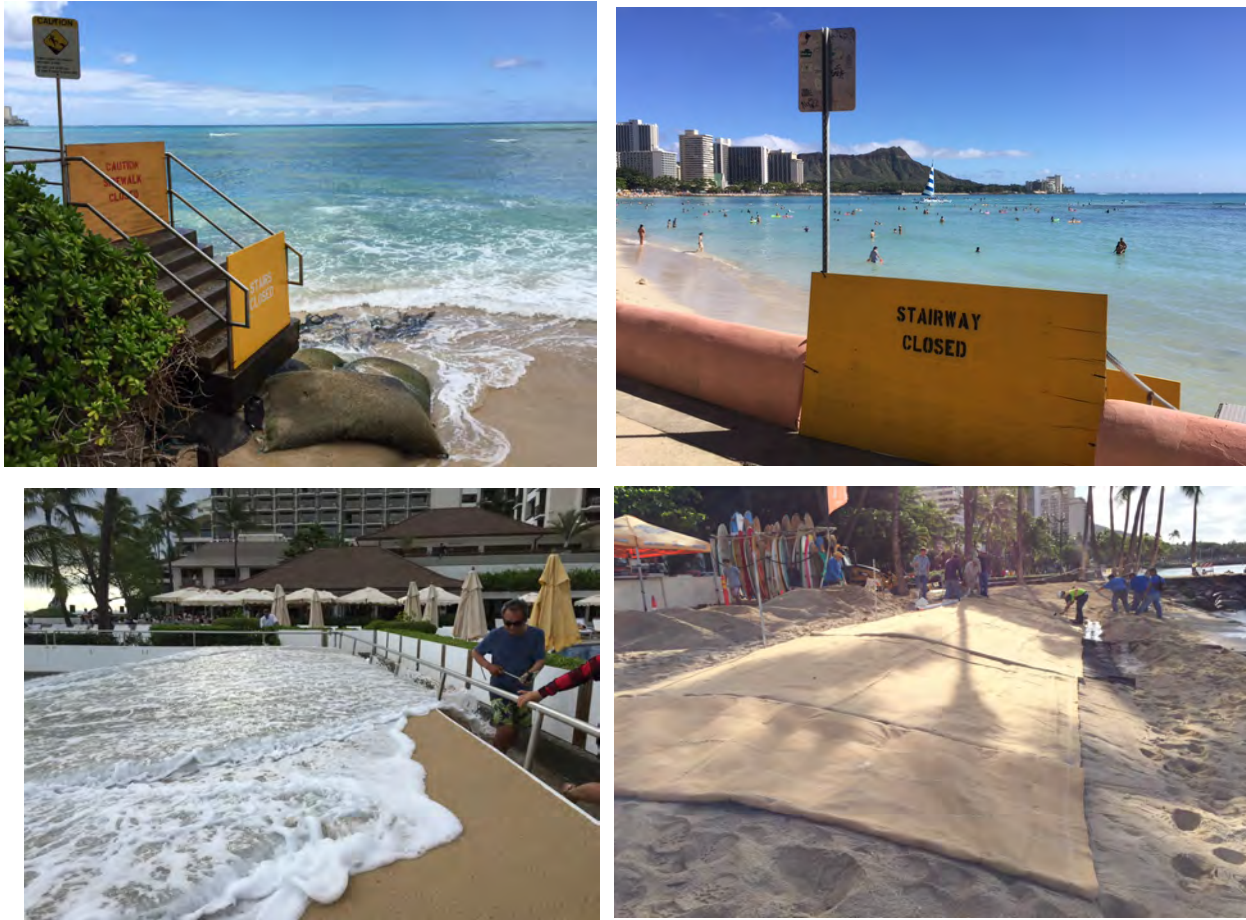


**Figure 10:** Beach nourishment at Kūhiō Beach showing the nearshore dredging system and dewatering basin onshore. 2012.

### **Emergency Projects**

The formation of the Waikīkī Beach Management Plan is in part, due to the severity of past emergency beach erosion issues. There have been several urgent erosion and inundation problems throughout Waikīkī including seasonal beach erosion at the Fort DeRussy, Halekulani, Gray’s Beach, Royal Hawaiian, Kuhio Beach and Kapiolani beach (Figure 4). In some cases these problems were severe enough to require the temporary closure of beach access due to erosion (Figure 11). These type of emergency erosion events require rapid and well-coordinated response. This is a suitable role for the Waikīkī Beach Special Improvement District Association to serve in being able to identify problems early and immediate start to work with affected landowners and agencies for consultation and coordination. While each situation is different the coordinating function of the WBSIDA has proved to be extremely valuable in several recent emergency projects including the Kuhio Beach Emergency Erosion Blanket the City and County of Honolulu installed with WBSIDA coordination and support in December, 2017 (Figure 11).





**Figure 11:** Widespread emergency erosion and inundation issues in Waikīkī have resulted in temporary closure of public access at times and temporary erosion control measures.

### **Beach Maintenance, Cleaning and Sand Recovery Opportunities**

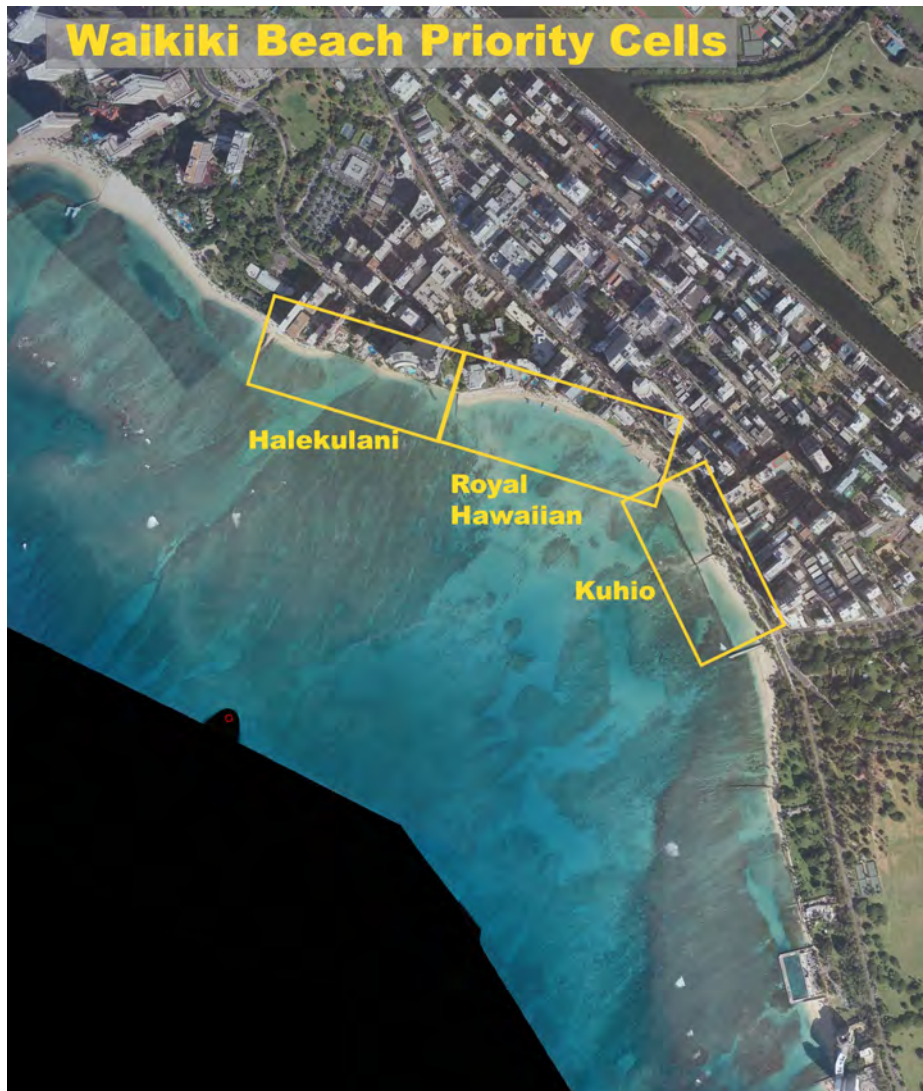
Several beach maintenance projects have already been identified through the development of this Beach Management Plan. Some of the highest priority projects include; conducting beach profile maintenance using long-armed equipment to re-distribute beach sand in the Kuhio basins that has slumped seaward over time. This project would not only bring a much-needed source of beach sand to these beach areas but may also serve as an important source of sand for an emergency fill for sandbags at Kuhio beach in the form of a stub groin (see section below on Kuhio Beach Groin). This type of beach profile maintenance using existing beach sand within the swim basin was commonly done in the past but regulatory constraints have restricted this practice.

Another opportunistic project the WBSIDA is exploring is to develop a public outreach campaign to try to keep sand on the beach. There are estimates of beach loss over 10,000 yd<sup>3</sup>/yr based on qualitative records of the sand extracted from the public shower sumps on a weekly basis. The WBSIDA is exploring opportunities to recapture this sand and place it back on the beach after treatment. Another opportunity is to educate and encourage beach goers to wash their feet before leaving to beach to avoid a small but significant sand loss source when multiplied by the millions of visitors to Waikīkī Beach each year.

### New Shoreline Structures

Future projects are currently being evaluated through an ongoing State Dept of Land and Natural Resources (DLNR) Technical Feasibility Study for Waikīkī Beach. The DLNR has initiated a project with a local engineering and consulting firm (Sea Engineering, Inc) for a Feasibility Study, Environmental Impact Statement (EIS) and Project Design and Permitting for beach improvements at Waikīkī Beach, O’ahu, Royal Hawaiian Groin. As part of this effort and in coordination with the results of the March, 2018 Waikīkī Beach Community Advisory Committee several high-priority projects are being investigated (see Figure 1&2). These may include new shoreline structures or re-design of existing structures to stabilize the beach (Figure 12). Some of the potential projects being considered include:

- Kuhio Beach sandbag groin
- Kuhio Basins structural re-design and water quality flushing improvements
- Gray’s and Halekulani Beach restoration and stabilizing structures
- Fort DeRussy groin repair and improvements



**Figure 12. High Priority Beach areas for future new construction.**



### **Nearshore Water Quality**

The WBSIDA is a founding member of the Ala Wai Watershed Collaboration (AWWC), a collaboration between public, private sector and community leaders. The AWWC goals include: 1) raise awareness and engage the community in developing innovative solutions to improve the Ala Wai watershed; and 2) develop an innovative regional planning and financing mechanism – or Community Investment Vehicle (CIVic) – to facilitate the design, operation and maintenance of a lasting solution to the Ala Wai. A central focus of this initiative is to facilitate projects that will improve the condition of water quality in the Ala Wai Canal. Another pilot project is under development to capture and dispose of debris in the Ala Wai before it enters the Ala Wai Harbor and ocean.



The Ala Wai Canal has the potential to be an exceptional natural resource. While some might simply look upon its current state with unease and complacency, others see it brimming with opportunities-- that would transform the waterway from an economic and environmental liability to a beautiful and invaluable asset. The Ala Wai Watershed Collaboration consists of experts and stakeholders across multiple jurisdictions and communities., including the Hawaii Tourism Authority, City & County of Honolulu, Hawai‘i Department of Land and Natural Resources, Waikīkī Improvement Association, Waikīkī Beach Special Improvement District Association, University of Hawai‘i, Ala Wai Watershed Association, and many others.

Previous efforts toward a watershed solution saw the same primary obstacle: concern from government agencies in assuming financial responsibility for operations and maintenance. Addressing this problem, the Hawaii Tourism Authority has provided the collaboration with a \$250,000 grant to initiate the creation of a community reinvestment district that will take financial responsibility for maintenance efforts. The grant will also fund the establishment and proposal of a watershed masterplan. HTA requires a cash match of \$125,000, and Waikīkī business stakeholders have pledged \$62,500 so far, half of the required amount.

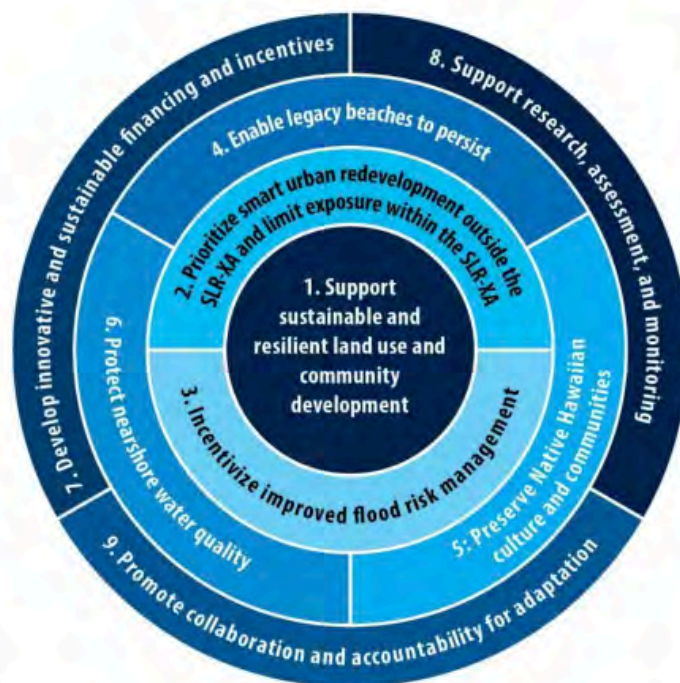
### **Reef Restoration and Ground Water Monitoring**

Initiatives under these focus areas are currently under development but highlight the interconnectedness and importance of the nearshore water quality and reef health. There is a direct link between good water quality and what is considered a “good” beach. The WBSIDA is currently supporting social science research to explore the public’s perception of Waikīkī Beach and to identify the core values for residents and visitors when they come to Waikīkī. Reef restoration efforts are being led by the Dept of Land and Natural resources with key research and support from the University of Hawai‘i and the Waikīkī Aquarium. This suggests a very strong possibility of conducting a pilot reef restoration project in Waikiki.

## Climate Change Impacts and Nearshore Water Quality

Active research at the University of Hawai‘i is currently underway by the University and the State DLNR to evaluate the impact of sea-level rise on Hawai‘i’s coastal communities including Waikīkī. This research has resulted in the [Sea Level Rise Vulnerability and Adaptation Report](#), which was released in December, 2017. This report provides the first state-wide assessment of Hawaii’s vulnerability to sea level rise and recommendations to reduce our exposure and sensitivity to sea level rise and increase our capacity to adapt. Sea-level rise vulnerability was assessed in terms of potential impacts to land use, people, property, cultural and natural resources, and critical infrastructure. Waikīkī is especially vulnerable to sea-level rise being a filled area with water on all sides (Figure 13). As the only U.S. state that is an island, Hawai‘i is highly vulnerable to the effects of sea level rise. Vulnerability to sea level rise is based on modeling chronic coastal flooding with sea level rise due to passive flooding, annual high wave flooding, and coastal erosion. The Hawai‘i Sea Level Rise Vulnerability and Adaptation Report provides a range of sea level rise projections and vulnerability scenarios, the SLR-Exposure Area with 3.2 feet of sea level rise was chosen to depict hazards that may occur in the mid to latter half of this century (Hawai‘i Climate Change Mitigation and Adaptation Commission, 2017).

The assessment utilizes three chronic flooding hazards, passive “bathtub” flooding, annual high wave flooding, and coastal erosion. The footprints of these three hazards were combined to define the projected extent of chronic flooding due to sea level rise, called the sea level rise exposure area (SLR-XA). The model uses 3.2 feet of global sea level rise by year 2100 (IPCC 2014) as an input. Recent observations and projections suggest that this magnitude of sea level rise could occur as early as year 2060 under more recently published highest-end scenarios (Sweet et al. 2017) (Hawai‘i Climate Change Mitigation and Adaptation Commission, 2017). The information provided in this assessment is extremely useful to the development of Beach Management Plans and projects that will ultimately have to accommodate the future water levels and conditions.



Recommendations to improve Hawaii's capacity to adapt to sea level rise

Potential impacts of predicted sea-level rise include:

1. Chronic coastal inundation and beach erosion.
2. Ground water inundation and flooding.
3. Interruption of critical services such as wastewater, power and communication services located underground and below the water table.
4. Transportation may be affected by chronic flooding and backing up of storm water systems.
5. Nearshore water quality and beach resources may be impacted by submarine and subsurface inundation.

## Sea Level Rise : Hawai'i Sea Level Rise Viewer



**Figure 13.** Results of Hawai'i Sea-Level Viewer showing the 3.2 ft SLR-XA for Waikiki. Results from: <http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/>



## **FUTURE AND PLANNED PROJECTS**

Waikīkī Beach is a globally recognized icon of Hawai‘i and is the state’s largest tourist destination. Waikīkī Beach also has tremendous cultural significance and is the modern birthplace of the sport and culture of surfing. The beaches, reef ecosystems, and myriad world-renowned surf breaks are valuable natural resources that support the culture and lifestyle of Hawai‘i, and the idyllic image of Waikīkī.

Waikīkī Beach is a highly engineered urban shoreline with the modern configuration largely the result of past management efforts (e.g., groins, seawall, and sand fill) intended to widen the beach.

Therefore, it is important to fully understand the cumulative effects of shoreline development, recreational activities, and coastal processes (natural and human-induced) that control the movement of sand within the littoral system.



### **Waikīkī Beach Long-Term Goals**

1. The WBSIDA continue to develop and implement the Waikīkī Beach Management Plan.
2. Facilitate priority projects and coordinate government and private stakeholders on beach management projects in Waikīkī.
3. Ensure that future beach management projects identify and address the issues and concerns relevant to the Waikīkī community and local stakeholders.
4. Support community coordination, education, and outreach efforts about beach management issues and projects in Waikīkī.
5. Identify and evaluate alternatives for beach management and maintenance in Waikīkī.

### **Waikīkī Beach Potential Future Projects**

Future projects are currently being evaluated through an ongoing State Dept of Land and Natural Resources (DLNR) Technical Feasibility Study for Waikīkī Beach. The DLNR has initiated a project with a local engineering and consulting firm (Sea Engineering, Inc) for a Feasibility Study, Environmental Impact Statement (EIS) and Project Design and Permitting for beach improvements at Waikīkī Beach, O‘ahu, Hawai‘i. The primary objective of the project is to create and support a stable and resilient beach in Waikīkī while improving beach conditions and shoreline structures. The Project analysis and recommendations will also consider the unique natural, historical, cultural, and economic value of Waikīkī. The primary outcome of the project is development of a Feasibility Study, Environmental Impact Statement (EIS), and project conceptual designs for beach improvements at Waikīkī for the Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL). Specific project engineering designs and improvement plans will be developed over the project lifetime.

The project is part of a broader collaborative initiative, the “*HO’OMAU ‘O WAIKĪKĪ KAHAKAI*” which includes development of a community-based beach management plan, economic study of the value of Waikīkī Beach, stakeholder perception surveys, and other related endeavors. These supporting efforts are being carried out in coordination with the Department of Land and Natural Resources, the Waikīkī Beach Special Improvement District Association (WBSIDA) and the University of Hawai‘i Sea Grant College Program (Hawai‘i Sea Grant). Strategic Outreach efforts will help define the primary project priorities and strategies. The WBSIDA has developed a Waikīkī Beach community advisory committee to help inform project development, serving as a community representative to the project team.

**Potential Projects for Waikīkī Beach**

1. Royal Hawaiian Groin restoration/re-construction.
2. Shoreline stabilization and restoration at Kuhio Beach.
3. Beach restoration at Halekulani (Gray’s) Beach
4. Beach maintenance at Royal Hawaiian using nearshore sand.
5. Beach maintenance and redistribution at Kuhio Beach using existing sand.
6. Sand back passing project at Fort DeRussy.



## MANAGEMENT PLAN OUTCOMES AND IMPLEMENTATION STRATEGIES

### MANAGEMENT PLAN OF ACTION

It is essential that beach management strategies reflect the current state of coastal scientific and engineering knowledge and are designed to address the specific needs of each littoral cell along Waikīkī Beach. To achieve this goal, a beach management plan for Waikīkī needs to balance protection and improvement of beach resources with the economic, social, cultural, recreational, environmental, and historical aspects of Waikīkī Beach.

#### ***Waikīkī Beach Management Plan***

##### ***Phase 1: Needs Assessment***

The purpose of the *needs assessment* phase is to evaluate the management needs of each littoral cell. This will include: identification of the issues and concerns related to natural, economic, cultural, and recreational resources at Waikīkī Beach through scientific data and stakeholder engagement; a comprehensive review of past projects and shoreline protection; review and discussion of relevant legal, planning, regulatory, and permitting issues; and data collection to establish current baseline conditions.

##### ***Phase 2: Alternatives Analysis***

The purpose of the *alternatives analysis* phase is to identify and evaluate potential beach management strategies for each littoral cell including but not limited to beach nourishment, sand back-passing, and repairs and improvements to shoreline structures. Phase 2 will also include an assessment of the advantages and disadvantages of potential beach management strategies at Waikīkī, drawing heavily from experience and lessons learned in past beach management and coastal engineering efforts at Waikīkī.

##### ***Phase 3: Economic Value Analysis***

The expected outputs of the *economic valuation* study are defensible economic values for Waikīkī Beaches and incremental changes to that value under alternative scenarios. This value can be used to estimate the beach, nearshore ecosystem value, storm mitigation benefits and losses due to erosion.

##### ***Phase 4: Plan Development***

The purpose of the *plan development* phase is to compile the findings of the needs assessment and alternatives analysis into a comprehensive beach management plan that will serve as a “living” guidance document for beach management in Waikīkī. The plan will draw heavily upon input from key stakeholders and will include sections focusing on the history and evolution of Waikīkī Beach, coastal processes and littoral dynamics in Waikīkī, coastal engineering solutions for beach management, and recommendations for beach management projects in Waikīkī.

##### ***Phase 5: Implementation***

The purpose of the *implementation* phase is to take the necessary steps to bring the plan to action. The proposed Waikīkī Beach management outreach coordinator will work closely with local stakeholders and state resources agencies, through this phase. The Waikīkī Beach management outreach coordinator could facilitate implementation of beach management projects by initiating the planning process for selected projects; presenting the overall beach management plan and individual beach management project plans to stakeholders to address concerns and gain political and community support for implementation; coordinating funding sources to support the recommendations set forth in the plan; assisting with applications to regulatory agencies in seeking authorization for beach management projects; and assisting with oversight and management of beach improvement projects.

## Project Outreach

Stakeholder engagement and project outreach will be crucial for generating community input and eventually support for the specific design concepts that are generated through each project. Stakeholder engagement is a recurring theme throughout every project. The purpose is to identify stakeholder concerns, gather feedback on potential beach management strategies and alternatives, develop collaborative partnerships and agreements, and build stakeholder consensus. Interviews, focus group meetings, and workshops are being held with key stakeholders in the public sector, private sector, and the Waikīkī community to identify information needs, concerns, and support for various beach management strategies. A series of public meetings provide opportunities to educate stakeholders and the general public with topics to include the history and evolution of Waikīkī Beach, coastal and beach processes in Waikīkī's littoral cells, historical and modern approaches to beach management, and coastal hazards (including sea level rise).



**Figure 14. Waikīkī Beach has a reputation as a high-density urban beach supporting many local businesses.**

The Waikīkī Beach Special Improvement District Association (WBSIDA) in partnership with Hawai'i Sea Grant is supporting/leading the Waikīkī Beach Management Plan (Plan), Waikīkī Beach Management coordinator and related projects. The Plan will serve as an overarching framework for the development, evaluation and implementation of a technical beach management alternatives for Waikīkī. The Plan is intended to serve as the conduit for project funding, stakeholder engagement and stakeholder input and oversight of proposed projects. The University of Hawai'i Sea Grant College Program in partnership with the WBSIDA has identified strategies for the development and implementation of the Beach Management Plan for Waikīkī. The primary Waikīkī Beach Management Plan-May, 2018

purpose of such a management plan is to identify, assess and prioritize beach management projects and policies in Waikīkī for future beach maintenance and to facilitate potential funding sources and partnerships for these projects.

### **Project Outcomes and Implementation Strategies**

A desired outcome of the Waikīkī Beach Management Plan is to ensure that the plan reflects the vision and priorities of the stakeholders as well as incorporating and utilizes innovative coastal, scientific, engineering and practical knowledge as it applies to the challenges of beach management at Waikīkī Beach. The WBMP balances protection and improvement of coastal resources with the unique economic, cultural, and historical concerns for Waikīkī. The Plan identifies long and short-term beach maintenance implementation strategies and may provide a template for improved management in other coastal areas in Hawai‘i and throughout the Pacific. The WBMP includes recommendations for prioritization of beach maintenance projects based on stakeholder vision, needs, and available funding.

#### **Waikīkī Beach Management Plan Implementation Strategies**

1. Identify short, mid and long-term beach maintenance projects and funding sources.
2. Identify priority assets, problems and preferred solutions for beach projects in Waikīkī.
3. Foster and support strong public-private partnerships through the WBSIDA.
4. Provide financial, policy, regulatory/legislative support for priority projects in Waikīkī.
5. Support research and assessments of social-cultural, economic and environmental values and issues of Waikīkī Beach.

The WBMP incorporates and utilizes innovative and state of the science coastal, scientific, engineering knowledge as well as traditional, practical knowledge as it applies to the challenges of beach management in Waikīkī Beach. The plan attempts to balance protection and improvement of coastal resources with the unique economic, cultural, and historical concerns for Waikīkī. The Plan includes recommendations for prioritization of beach maintenance projects based on stakeholder vision, needs, and available funding. The WBMP will ultimately be implemented through partnerships with local regulatory authorities and stakeholders with coordination assistance from the Waikīkī Beach Management coordinator. The WBMP identifies issues negatively impacting Waikīkī Beach and provides recommendations for comprehensive and sustainable solutions as well as fruitful examples of private-public partnerships.

The Waikīkī Beach Management Plan includes several primary objectives for implementation:

- Develop, stabilize and utilize a private funding mechanism for the development of the beach improvement projects identified in the Plan.
- Identify key beach management issues related to the natural, economic, cultural, and recreational resources of Waikīkī beach through stakeholder and community engagement.
- Identify and evaluate potential management and engineering strategies to correct, enhance, and maintain the littoral system of Waikīkī.
- Inventory and assess past beach management and coastal engineering efforts, including an analysis of lessons-learned, which may be applied in improving future beach management.
- Assess advantages and disadvantages of potential management and engineering strategies as related to protecting and improving the cultural, socio-economic, recreational, historical, and natural resources of Waikīkī Beach.
- Facilitate stakeholder and government networks and partnerships for long-term cooperative and sustainable management of the beach resources at Waikīkī.
- Provide a framework for stakeholder feedback, input and oversight of the Plan, and proposed beach improvement projects.
- Support the goals of relevant stakeholders as it relates to beach management in Waikīkī.
- Expand the understanding of the potential impacts of climate change on Waikīkī Beach, including the threat of increased beach erosion with sea-level rise.

Expected Management Plan Outcomes and Impacts

- Improved stakeholder and community understanding of coastal dynamics, coastal hazards relating to coastal erosion and sea-level rise, and beach management options in Waikīkī.
- Improved ability to develop *and implement* long and short-term beach management strategies to maintain and improve the beach systems in Waikīkī.
- Improved understanding of project timeframes and construction and regulatory constraints.
- Improved coordination, collaboration, and partnerships between public and private stakeholders with a shared interest in improved management of Waikīkī beaches.

## **Project Outreach Strategies and Activities:**

### **1. Waikīkī Stakeholder Outreach**

*Description:* Targeted Stakeholder outreach and education efforts. Community outreach will highlight the need for sustained long-term capital improvements and comprehensive beach maintenance in Waikīkī Beach to sustain its unique qualities.

*Objective:* Provide Project updates and gather feedback on Project details and data.

*Target audience:* Targeted Stakeholders of Waikīkī. (see Stakeholder list)

*Specific Outcomes:*

- Provide accurate and up to date Project information and serve as a Stakeholder liaison for the project.
- Solicit feedback from Stakeholders and WBSIDA members on Project goals and various conceptual designs.
- Coordinate informational meetings for targeted Stakeholders
- Serve as a Project representative to answer questions and access to up-to-date and accurate Project information.
- Development and maintenance of a Project website in partnership with the DLNR.

## **2. Public Community Outreach Meetings**

*Description:* Ongoing community informational meetings.

*Objective:* Provide Project updates and gather feedback from community on Project details.

*Target audience:* Community members of Waikīkī. (see Stakeholder list)

*Specific Outcomes:*

- Provide accurate and up to date Project information and serve as a community liaison for the project.
- Solicit feedback from community on Project goals and various conceptual designs.
- Collaborate with community and organize community “listening Sessions” and informational meetings to ensure there is a sense of being “heard.”
- Serve as a Project representative to answer questions and ensure the community has access to up-to-date and accurate Project information.
- Development and maintenance of a Project website in partnership with the DLNR.

## **3. Waikīkī Community Advisory Committee**

*Description:* A representative community advisory committee with local knowledge of Waikīkī Beach history, social, cultural and economic conditions.

*Objective:* A community advisory committee will help to address the complex issues associated with beach sustainability by building consensus and resolving conflicts relating to engineering information on Waikīkī Beach.

*Target audience:* See Advisory Committee Membership listing.

*Specific Outcomes:*

- An advisory committee will provide guidance and project feedback for planning and prioritizing future beach management projects at Waikīkī.
- **Provide local knowledge and expertise** about important social, cultural, economic and environmental issues related to Waikīkī Beach.



- **Provide strategic insights** on Waikīkī Beach management and ideas to overcome obstacles, capitalize on opportunities, and support long-term planning.
- **Facilitate partnerships** with relevant agencies, organizations and individuals.
- Advise the WBSIDA, the DLNR and UH Sea Grant on the development and implementation of a Waikīkī Beach Management Plan.
- Ensure that future beach management projects address the issues and concerns of the Waikīkī community and local stakeholders.
- Advise the State, County and private stakeholders on specific beach management projects in Waikīkī.
- Provide community coordination, education, and outreach efforts about beach management issues and projects in Waikīkī.
- Provide diverse perspectives and guidance for future beach management and planning activities in Waikīkī.

Assess and evaluate proposed alternatives for beach management and maintenance in Waikīkī.

#### **4. Media Engagement and Outreach**

*Description:* Strategic and opportunistic media engagement for Project updates, informational briefings and press conferences.

*Objective:* Provide support to the DLNR on Project updates and status on Project details and conditions.

*Target audience:* General Hawai‘i and national media (print and news)

*Specific Outcomes:*

- Provide accurate and up to date Project information.
- Develop specific talking points and media informational fact sheets and materials for Project updates.
- Support the DLNR with press conferences and press releases, serve as a media liaison as needed.
- Provide updates on Project goals as well as various conceptual designs.
- Provide media updates and exposure for Project community “listening Sessions” and informational meetings.
- Serve as a Project liaison to direct questions and ensure the media has access to up-to-date and accurate Project information.
- Development and maintenance of a Project website in partnership with the DLNR.

## **5. Waikīkī Stakeholder Design Charrettes**

*Description:* A series of community and stakeholder special planning meetings where various design and management options are visualized and discussed through a planning process.

*Objective:* Provide project updates to community and Stakeholders and gather feedback on specific Project designs. Design charrettes will facilitate review and discussion for conceptual designs and community “Visioning” for long-term management plans for Waikīkī Beach.

*Target audience:* Waikīkī Stakeholders and Community

*Specific Outcomes:*

- Provide local knowledge and expertise about important social, cultural, economic and environmental issues related to Waikīkī Beach.
- Provide strategic insights on Waikīkī Beach management and ideas to overcome obstacles, capitalize on opportunities, and support long-term planning.
- Ensure that future beach management projects address the issues and concerns of the Waikīkī community and local stakeholders.
- Provide design feedback to the State, County and private stakeholders on specific beach improvement and management projects in Waikīkī.
- Identify and evaluate alternatives for beach maintenance in Waikīkī.

## **6. Waikīkī Beach Stakeholder Satisfaction Surveys**

*Description:* Development and coordination of a community satisfaction survey on the current conditions of Waikīkī Beach.

*Objective:* Provide feedback to the Project managers as well as local resource managers on the current level of satisfaction from various user groups in Waikīkī.

*Target audience:* Targeted Waikīkī community and Waikīkī Beach visitors.

*Specific Outcomes:*

- Web based survey instrument that provides a quantitative measure of satisfaction levels of Waikīkī Beach.
- The survey data is relevant to the needs of local resources managers and regulatory agencies.
- Survey results are distributed through various outreach methods and partners using traditional extension methods and opportunist outreach venues.
- Survey outreach provided to critical partners such as the Hawai‘i Tourism Authority, WBSIDA, WIA, WBID, DLNR C&C and others.

## **CONCLUSIONS AND SUMMARY OF PRIORITY RECOMMENDATIONS**

The Waikīkī Beach Special Improvement District Association has taken the lead on facilitating, coordinating and supporting key projects in Waikīkī. The primary goal of the Waikīkī Beach Management Plan is to improve the quality and sustainability of the public beach resources along Waikīkī Beach. The WBSIDA will continue to provide the funding mechanism for beach planning efforts, project management and coordination of beach maintenance projects as well as a cost share for planned improvement projects. The WBSIDA leadership, coordination and cost share for future projects will play an important part in the ability of State and local partners to secure funding for new beach improvement projects in Waikīkī. The Waikīkī Beach Management Plan provides a clear management strategy and prioritized projects list that have been vetted through a community advisory committee to ensure the projects meet the goals and expectations of the Waikīkī community. The WBSIDA Beach Management Coordinator, will continue to work closely with key stakeholders to identify and assess issues and needs directly related to maintenance and improvement of the beach resources at Waikīkī. Improved, holistic beach management at Waikīkī will entail development and implementation of a dynamic and ongoing community planning process through the WBSIDA and the Waikīkī Beach coordinator. The WBSIDA continues to work closely with project partners to identify and assess opportunities and needs directly related to maintenance and improvement of the beach and nearshore resources in Waikīkī.

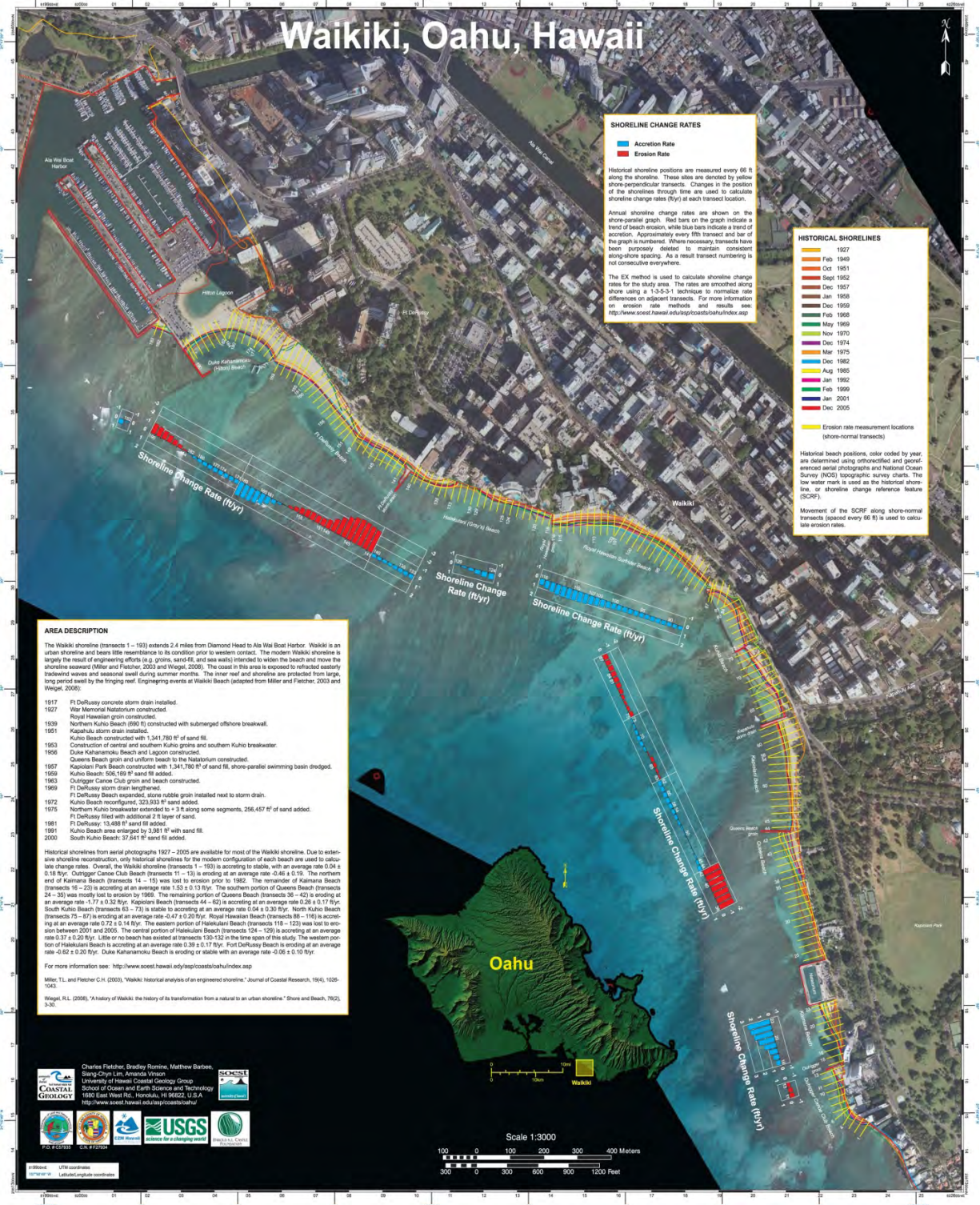
**APPENDIX A: MAP OF WAIKĪKĪ BEACH SPECIAL IMPROVEMENT DISTRICT**





# APPENDIX B: HISTORICAL COASTAL EROSION RATES FOR WAIKĪKĪ

(Source: University of Hawai'i Coastal Geology Group)





## **APPENDIX C: WAIKĪKĪ PROJECT PARTNERS AND STAKEHOLDERS**

### ***State Government***

- DLNR Office of Conservation and Coastal Lands
- DLNR Division of Boating and Ocean Recreation
- DLNR Land Division
- DLNR Engineering Division
- DLNR State Parks (Sans Souci State Recreational Park)
- DBEDT, Hawai‘i Tourism Authority (HTA)
- Office of Planning, Coastal Zone Management Program
- Department of Health, Clean Water Branch

### ***Local Government***

- City & County of Honolulu (C&C) Mayor’s office
- C&C Office of Climate Change, Sustainability and Resiliency.
- C&C Dept. of Planning and Permitting
- C&C Enterprise Services
- C&C Ocean Safety Division
- C&C Parks and Recreation
- C&C Facilities Maintenance

### ***Federal Government***

- NOAA Pacific Islands Regional Office
- U.S. Army Corps of Engineers, Pacific

Division Honolulu

- Fort DeRussy Military Reservation

### ***Hotels & Resorts***

- Hilton Hawaiian Village
- Kyo Ya Corporation
- Hale Koa
- Outrigger Hotels
- Halekulani Hotel
- Sheraton Waikiki
- Royal Hawaiian
- Moana Surfrider Hotel
- Pacific Beach Hotel
- Marriott Resort & Spa Waikiki
- Hyatt Regency Waikiki
- Aston Waikiki Beach
- New Otani Kaimana Beach Hotel

### ***Additional Key Stakeholders***

- Waikīkī Neighborhood Board
- Waikīkī Beach Special Improvement Association
- Waikīkī Improvement Association
- Waikīkī Business Improvement District
- Save Our Surf
- Surfrider Foundation
- Waikīkī Reef Watch
- Waikīkī Aquarium
- Waikīkī Beach Boys