



WATER FOR LIFE
Safe, dependable, and affordable water now and into the future


Board of Water Supply
City & County of Honolulu

Stakeholder Advisory Group

**Board of Water Supply
City & County of Honolulu**

Thursday July 25, 2019

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Board of Water Supply
City & County of Honolulu

Dave Ebersold
Facilitator

WELCOME

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Meeting Objectives

- ◆ Welcome new stakeholders
- ◆ Receive updates regarding the BWS
- ◆ Accept notes from meetings 29 and 30
- ◆ Follow up questions and answers regarding the panel discussion on climate change
- ◆ Receive results and discuss BWS's 2019 Customer Satisfaction Survey
- ◆ Discuss the DEIS for Haiku Stairs and receive input
- ◆ Receive information about the BWS budget for 2020 and related CIP projects

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New Stakeholder

- ◆ Dan Kouchi, Chamber of Commerce, Hawaii

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Ernest Lau
BWS Manager and Chief Engineer


BWS UPDATES

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Mahalo! **Questions & Answers**



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Action

Review and accept notes from


- ◆ Stakeholder Advisory Group Meeting #29 held on Thursday, January 24, 2019
- ◆ Stakeholder Advisory Group Meeting #30 held on Thursday, April 25, 2019

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Barry Usagawa
BWS Water Resources Program Administrator

CLIMATE CHANGE FOLLOW UP

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Climate Change Panel Experts

Chip Fletcher

Associate Dean for Academic Affairs and Professor of Earth Sciences at the School of Ocean and Earth Science and Technology (SOEST), University of Hawai'i at Mānoa, and is also Vice-Chair of the Honolulu Climate Change Commission

Tom Giambelluca

Professor in the Department of Geography and Environment at the University of Hawai'i at Mānoa

Josh Stanbro

Honolulu's Chief Resilience Officer, and serves as the Executive Director of the Office of Climate Change, Sustainability and Resiliency

Barry Usagawa

BWS Water Resources Program Administrator

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Water Utility Climate Alliance

Home About Us Member Agencies Plans & Publications Training & Presentations Contact

Delivering reliable, high-quality water requires a delicate balance between water supplies and customer demands. While water managers continually strive to maintain this supply-and-demand balance through long-term water resource planning and demand management, new challenges exist due to the impacts of climate change, putting the world's water resources at risk. The Water Utility Climate Alliance (WUCA) is dedicated to enhancing climate change research and improving water management decision-making to ensure that water utilities will be positioned to respond to climate change and protect our water supplies.

Brown and Caldwell

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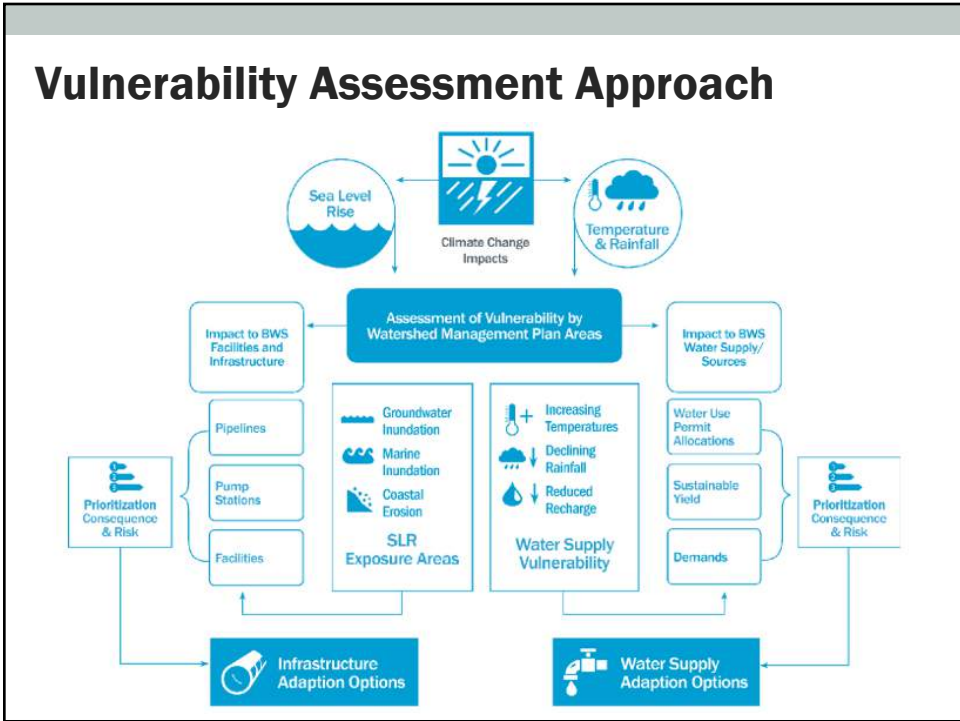
Brown and Caldwell | **Board of Water Supply** | **THE Water Research FOUNDATION**

Impacts of Climate Change on Honolulu Water Supplies and Planning Strategies for Mitigation

Barry Usagawa, P.E., Water Resources, Board of Water Supply



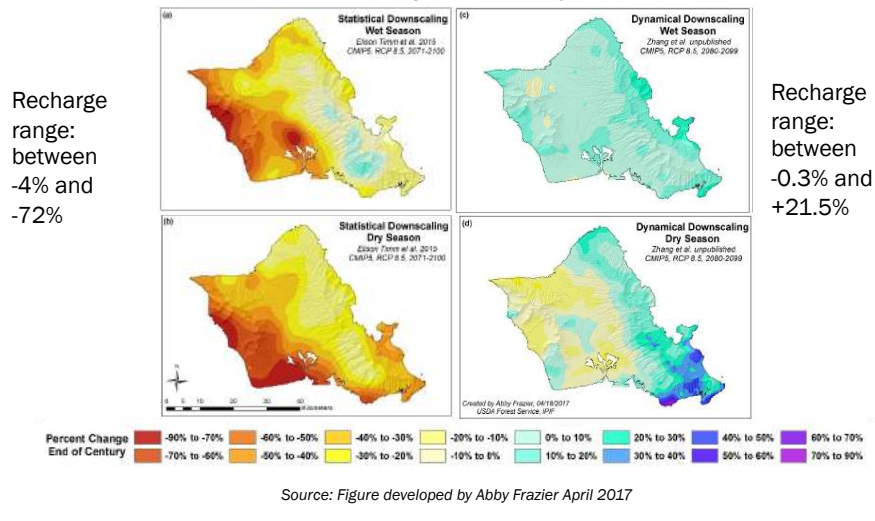
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Downscaled Climate Models indicate a Range of Rainfall Futures

Climate Change - Rainfall Projections



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Preliminary Supply Adaptation Strategies:

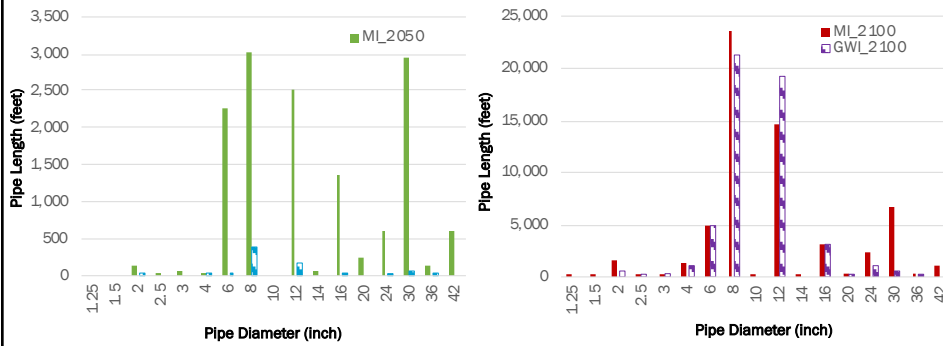
Recharge could decrease Oahu sustainable yields by ~27%. Statistical model From 407 mgd to 300 mgd a difference of 107 mgd, Turk, Report #9, B&C.

- Reduce per capita water demand from 155 gpcd to 100 gpcd through aggressive water conservation, like dual plumbing with recycled water
- Storm water capture in Nuuanu and on-site for new development
- Expanded Reuse at Honouliuli, Mililani, Wahiawa and Schofield WWTP's
- On-site reuse
- Increase transfers from Wahiawa and Waipahu Waiawa aquifers to Waianae and Honolulu. Drill more wells in Wahiawa and Waipahu-Waiawa
- Assertion of Public Trust Water Rights for Domestic Use to retain water use permits in a revocation process
- More desalination in Ewa and possibly for Honolulu
- Desalinated reuse in Honolulu, Waianae and Hawaii Kai where wastewater effluent is too salty for irrigation
- Indirect or Direct Potable Reuse with RO desalination and UV/Ozone disinfection

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Corrosion impacts to 21 miles of metallic pipelines with 3.2' of SLR by 2100

Time Period	Year	SLR (feet)	Pipe Lengths Impacted Island-wide by Hazard (feet)			
			Pipe Length for All Diameters (1.25-inch to 42-inch (feet)		Percent of Total BWS Infrastructure Impacted	
			MI	GWI	MI	GWI
Mid-Century	2050	1	14,038	772	0.1%	0.01%
End-of-Century	2100	3.2	60,409	52,026	0.6%	0.5%



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2017 - King Tide - Waikiki



Courtesy of OCCSR

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2017 - King Tide - Ala Wai Canal



Courtesy of OCCSR

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2017 - King Tide - Mapunapuna



Courtesy of OCCSR

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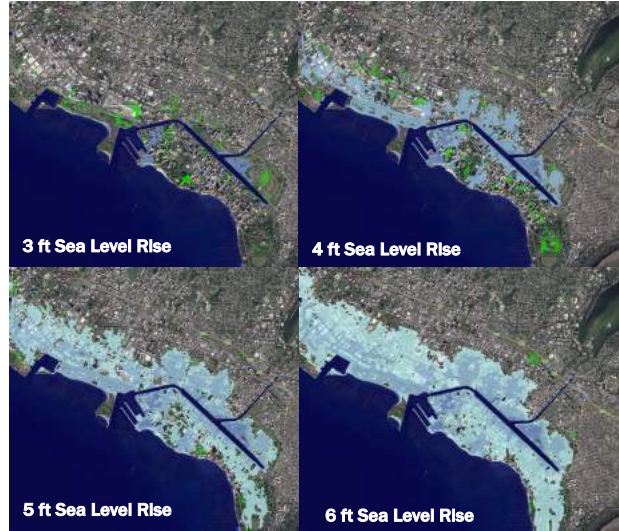
2017 - King Tide - Maunaloa, Ala Moana



Courtesy of OCCSR

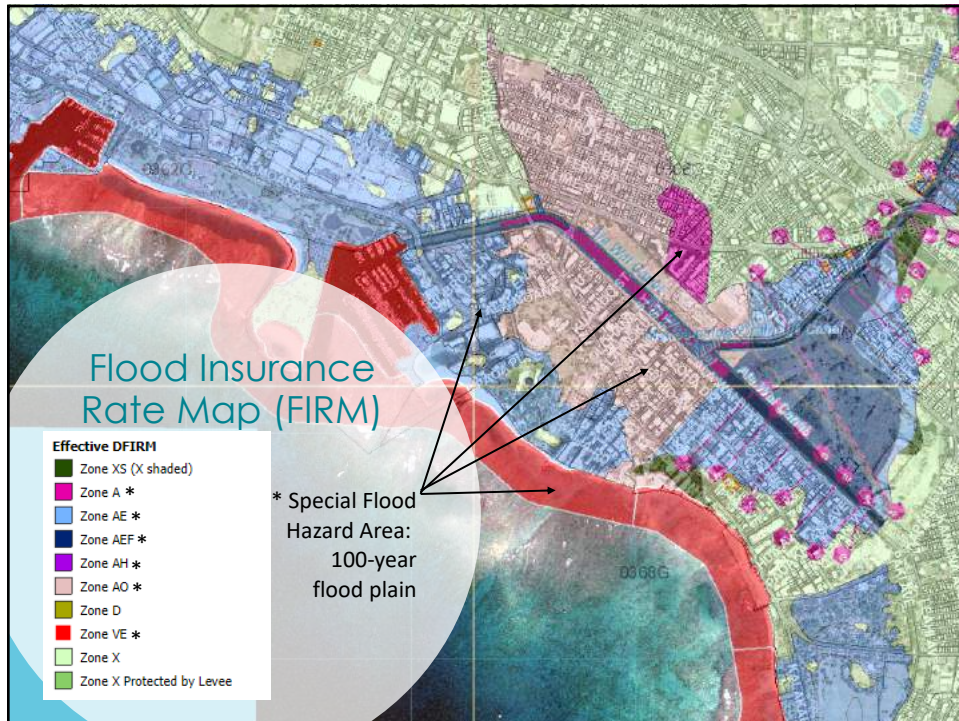
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End-of-Century Sea Level Rise Could be Greater



Source: Habel et al. 2017

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STORMWATER MANAGEMENT MASTER PLAN


Impacts of Sea Level Rise

- Higher groundwater
- Higher tides
- Increased flooding
- Decreased effectiveness of the existing stormwater system

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INFRASTRUCTURE RESILIENCY

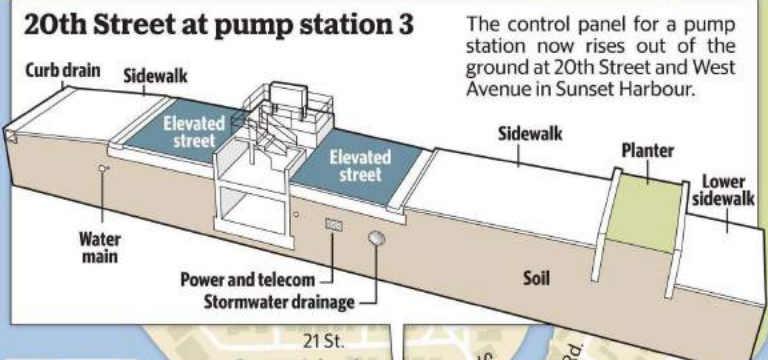
- Elevating Public & Private Infrastructure
- Stormwater Retrofits
- Updating/Replacing Utilities
- Green Infrastructure


Miami, WRA Webinar 2017

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20th Street at pump station 3



The control panel for a pump station now rises out of the ground at 20th Street and West Avenue in Sunset Harbour.



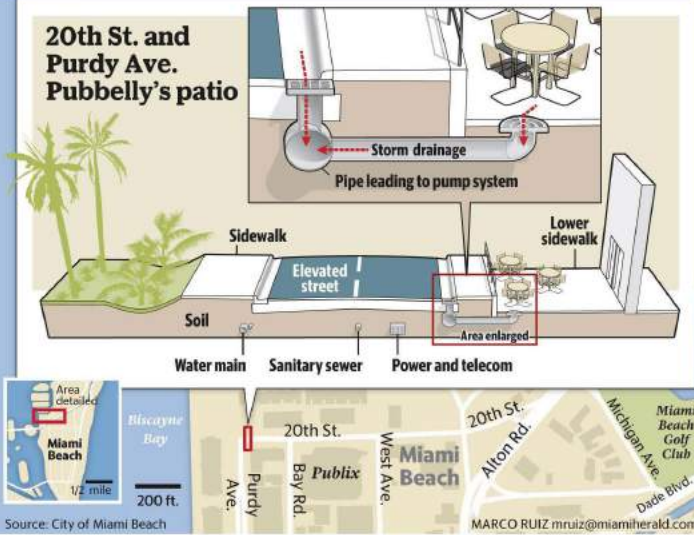
Area detailed
Miami Beach
1/2 mile
200 ft.



Miami, WRA Webinar 2017

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20th St. and Purdy Ave. Pubblelly's patio



This rendering shows the elevated roadway at 20th Street and Purdy Avenue, in front of Pubblelly restaurant. To the right, the patio in front of Pubblelly is about two feet lower than the street. Floor drains down there feed into the same pipes that connect to the curb drains on the road, which routes water to the pump station.

Miami, WRA Webinar 2017

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Sunset Harbour 20 Street & Purdy Avenue




Miami, WRA Webinar 2017


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WRF Study Identified Two Candidate Pilot Areas for Sea Level Rise Adaptation

West Waikiki



Iwilei



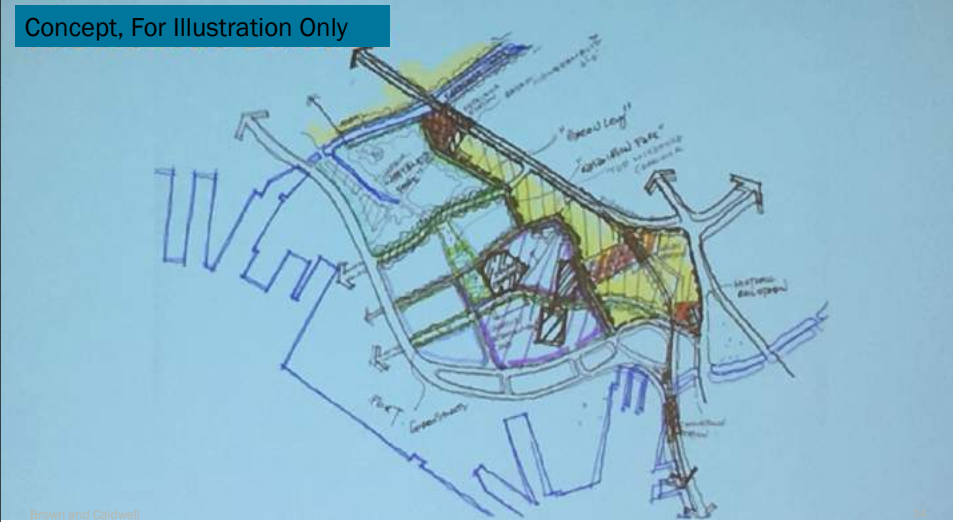
Possible Selection & Prioritization Criteria:

- Potential severity of social, economic, or environmental impacts
 - Taxable real estate; flood impacts to pedestrians, commercial and recreation activities, tourism, transportation and infrastructure.
- Opportunity to add SLR adaptation measures with proposed improvements
 - Ala Wai Flood Mitigation Project
 - Iwilei Transit Oriented Development Plan

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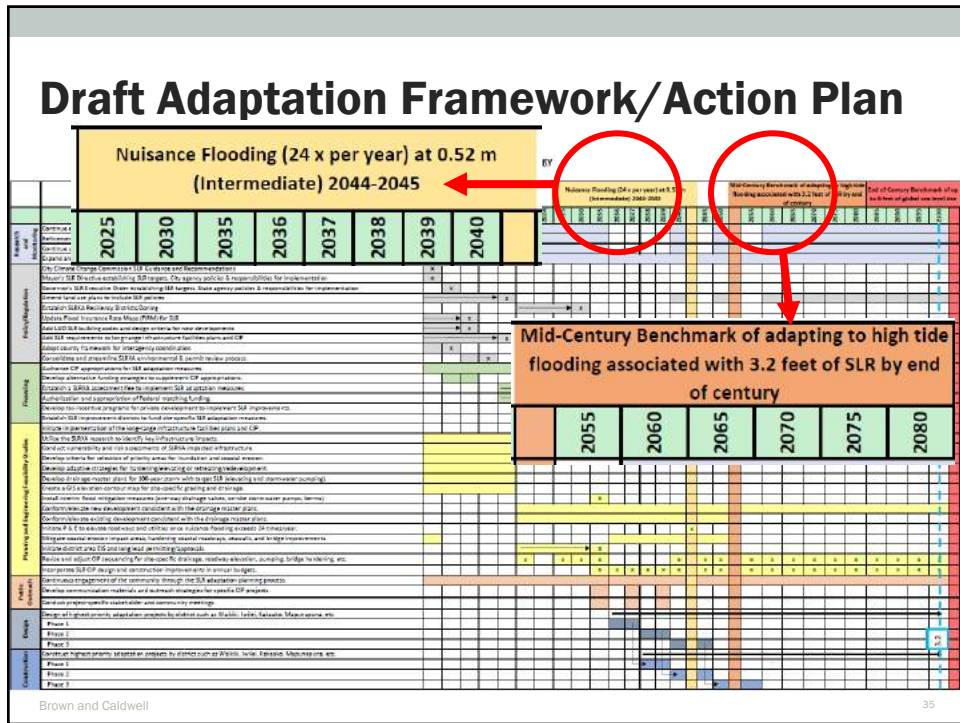
Iwilei Redevelopment Concept to Live with Water

Concept, For Illustration Only

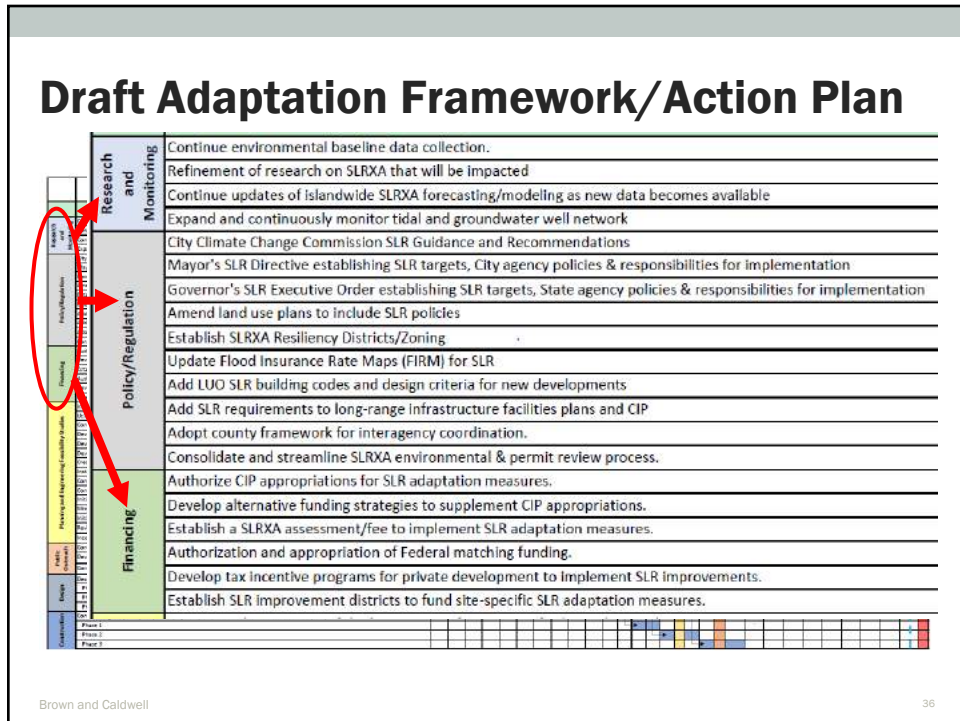


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Draft Adaptation Framework/Action Plan

Sea Level Rise Action Strategy

Research and Analysis Policy/Regulation Planning Design Construction	Plan and Engineering Feasibility Studies Initiate implementation of the long-range infrastructure facilities plans and CIP. Utilize the SLRXA research to identify key infrastructure impacts. Conduct vulnerability and risk assessments of SLRXA impacted infrastructure. Develop criteria for selection of priority areas for inundation and coastal erosion. Develop adaptive strategies for hardening/elevating or retreating/redevelopment. Develop drainage master plans for 100-year storm with target SLR (elevating and stormwater pumping). Create a GIS elevation contour map for site-specific grading and drainage. Install interim flood mitigation measures (one-way drainage valves, on-site stormwater pumps, berms). Conform/elevate new development consistent with the drainage master plans. Conform/elevate existing development consistent with the drainage master plans. Initiate P & E to elevate roadways and utilities once nuisance flooding exceeds 24 times/year. Mitigate coastal erosion impact areas; hardening coastal roadways, seawalls, and bridge improvements. Initiate district area EIS and long lead permitting/approvals. Revise and adjust CIP sequencing for site-specific drainage, roadway elevation, pumping, bridge hardening, etc. Incorporate SLR CIP design and construction improvements in annual budgets.
	Public Outreach Continuous engagement of the community through the SLR adaptation planning process. Develop communication materials and outreach strategies for specific CIP projects. Conduct project-specific stakeholder and community meetings.

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Draft Adaptation Framework/Action Plan

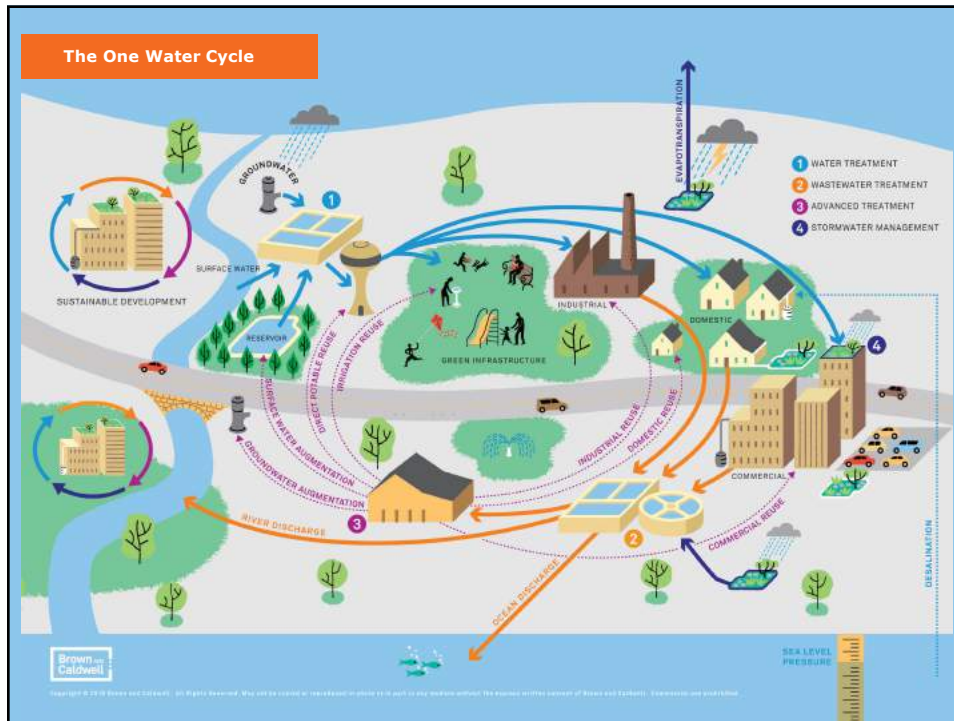
Sea Level Rise Action Strategy

Research and Analysis Policy/Regulation Planning Design Construction	Adaptation Measures Design of highest priority adaptation projects by district such as Waikiki, Iulei, Kakaia, Maunapuna, etc. Construct highest priority adaptation projects by district such as Waikiki, Iulei, Kakaia, Maunapuna, etc.
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Brown and Caldwell

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Acknowledgements

Research Team

Principal Investigators

- Dean Nakano,
- Lynn Stephens, P.E.
- Jon Turk, P.G.

Project Team

- Susan Mukai
- Joanie Stultz

Technical Advisory Committee

- Victoria Keener, PhD, Pacific RISA
- Tom Giambelluca, PhD, University of Hawaii (UH)
- Chip Fletcher, PhD, UH
- Scot Izuka, PhD, US Geological Survey (USGS)
- Delwyn Oki, PhD, USGS
- Lenore Ohye, Commission on Water Resource Management
- Joanna Seto, PE, Department of Health

Project Advisory Committee

- Nancy Matsumoto, Board of Water Supply
- Lurna Kaatz, Denver Water/Water Utility Climate Alliance
- Adam Carpenter, American Water Works Association
- David Yates, National Center for Atmospheric Research
- Kenan Ozekin, Water Research Foundation

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Questions and Answers

Q How do we make institutional policies to get condo complexes to install electric car charging stations?

A Requiring EV readiness requires legislation. Updated energy code—[Bill 25 \(2019\)](#)—would require **25% of parking spaces** in commercial and multi-family buildings (e.g., condo complexes) to be “**EV ready**” in **new construction** only.
Likely tough to get this adopted.

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Questions and Answers

Q What happens if we don't cut emissions by 50% every decade?

A 50% reduction per decade is a guideline, but without it there is no practical path to zero emissions by mid-century.
If we miss it, expect to pass certain “tipping points” such as extensive melting of Greenland and Antarctica, drought in the Amazon, massive tropical cyclones, and other responses.

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Questions and Answers

Q We will never be in complete agreement on solutions to dealing with climate change adaptation plans. How do we deal with differing opinions, compromises, and possibly even opposition to certain solutions?

A Great question and no simple answer. We all deserve to be heard. Need a safe forum for people to keep talking and keep working at solutions that we can agree upon.

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Questions and Answers

Q We talked about water supply with respect to climate change. How do stormwater and recycled water factor in to climate change planning?

A All have big roles. One Water plans around the interconnections of drinking water (groundwater), surface water, recycled water, stormwater, and sustainable development to best manage our combined water resources. Early stages of discussion. See City and County of Honolulu Annual Sustainability Report for more information.

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Questions and Answers

Q What is the best way to respond to people who push back on climate change and even say climate change isn't real?

A It's healthy to be skeptical, but believe your eyes. Look at the ocean and notice sea level rise. Be aware of more frequent and more intense storms, higher temperatures, and more flooding on our island. The effects of climate change aren't measured in single events – like one major storm – but as trends over time. And that's something we can see for ourselves.

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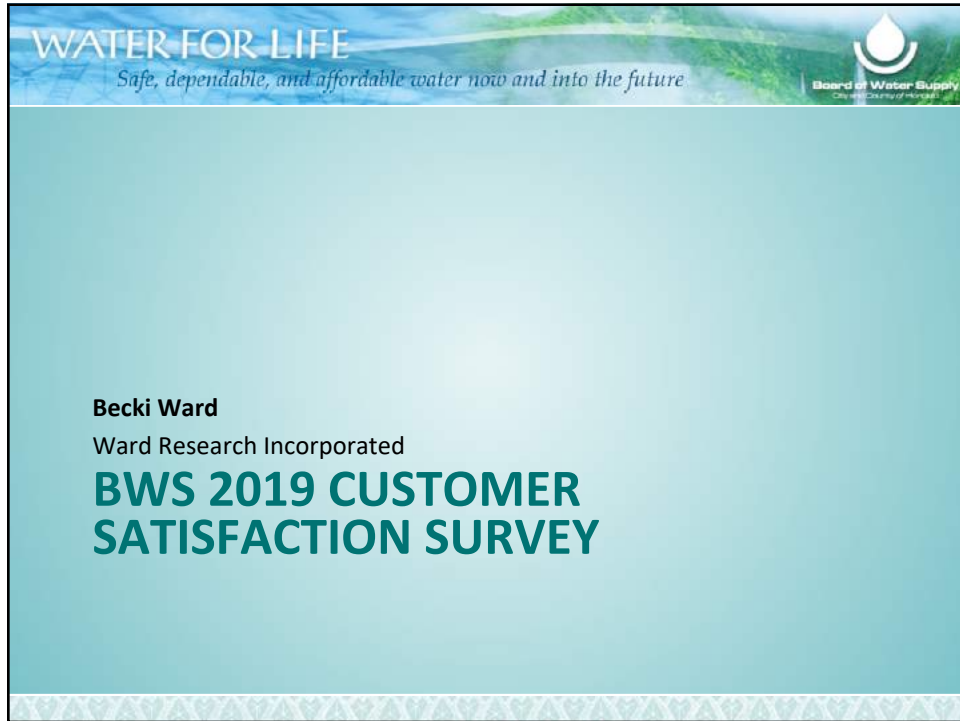
Board of Water Supply
City and County of Honolulu

Mahalo! **Questions & Answers**

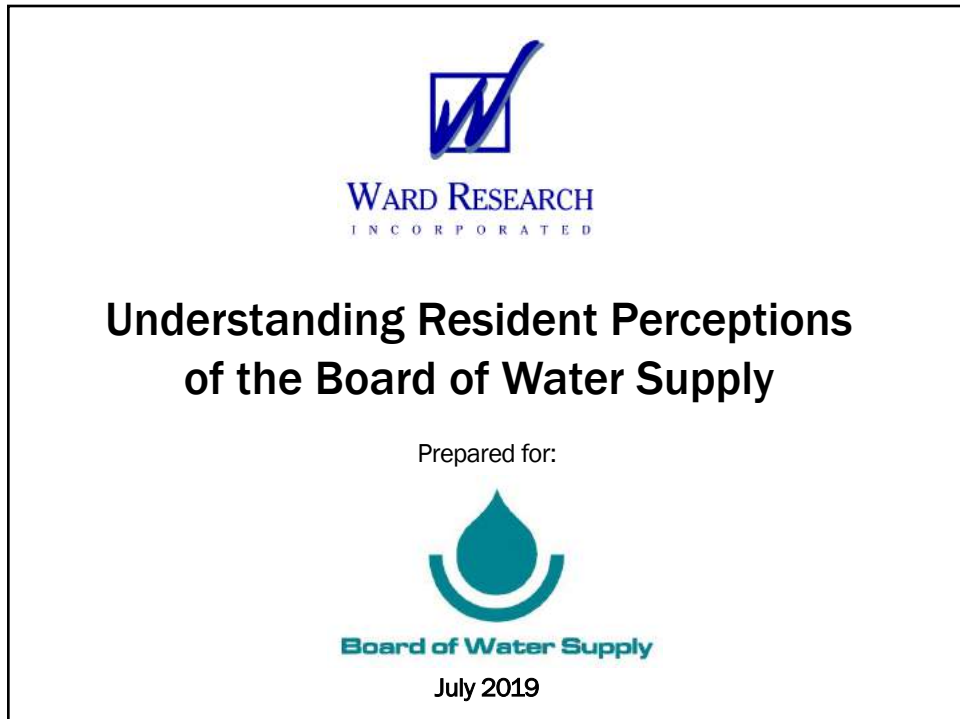
ENTRUSTED TO US TO
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FOR FUTURE GENERATIONS

The image is a promotional banner for the Board of Water Supply of the City and County of Honolulu. At the top, it features the slogan 'WATER FOR LIFE' in a bold, white font, with the tagline 'Safe, dependable, and affordable water now and into the future' in a smaller, italicized font below it. On the right side, there is a logo consisting of a white water drop above the text 'Board of Water Supply' and 'City and County of Honolulu'. The main body of the banner has a light teal background. On the left, the word 'Mahalo!' is written in a bold, teal font. To its right, the words 'Questions & Answers' are written in the same font. Below this text is a photograph of a young child splashing water, with the text 'ENTRUSTED TO US TO PRESERVE FOR FUTURE GENERATIONS' overlaid on the right side of the image. The bottom of the banner features a decorative border with a repeating geometric pattern.

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OBJECTIVES AND METHODOLOGY

OBJECTIVES

To track measures of satisfaction and other key metrics related to perceptions of the Board of Water Supply and the fulfillment of its mission

METHODOLOGY

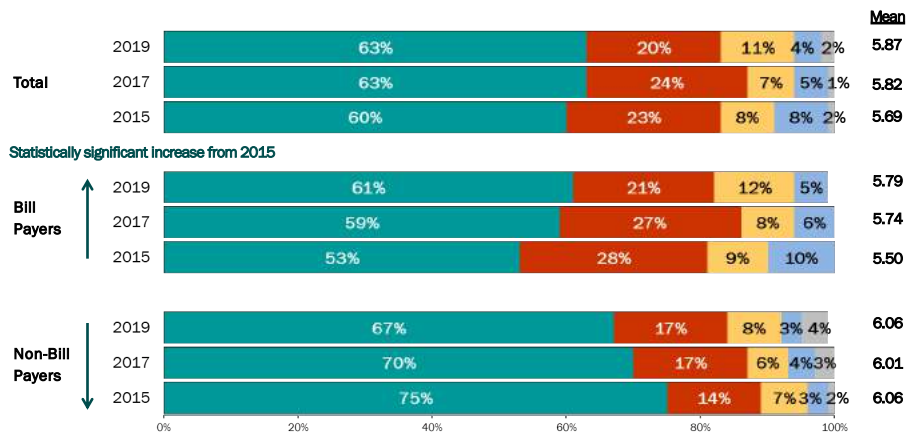
- Telephone survey
- April 1-22, 2019
- n=682 Oahu residents
- +/-3.6% maximum sampling error
- 3rd wave (2015, 2017) of tracking study

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OVERALL SATISFACTION WITH THE BWS

How would you rate your overall satisfaction with the Board of Water Supply?
1-EXTREMELY DISSATISFIED; 7-EXTREMELY SATISFIED

■ Strong Satisfaction (6-7 rating) ■ Moderate Satisfaction (5 rating) ■ Low Satisfaction (4 rating) ■ Dissatisfaction (1-3 rating) ■ Don't know



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TRACKING SATISFACTION WITH ATTRIBUTES

STRONG SATISFACTION: 6-7 RATING	2015	2017	2019
Providing water to customers	82%	83%	85%
Ability to provide dependable water	82%	78%	81%
Reliable service	76%	78%	79%
Quality of water	72%	73%	75%
Ability to provide safe water	77%	73%	74%
Water pressure	72%	69%	71%
Taste of water	70%	70%	69%
Courtesy of employees	63%	67%	68%
Overall professionalism of employees	63%	66%	66%
Overall customer service	62%	67%	64%
Format and presentation of the bill (bill payers only)	56%	58%	63%
Fast response to trouble calls	50%	58%	62%

Denotes statistically significant increase from 2015

Ward Research, Inc. ● Page 51

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TRACKING SATISFACTION WITH ATTRIBUTES

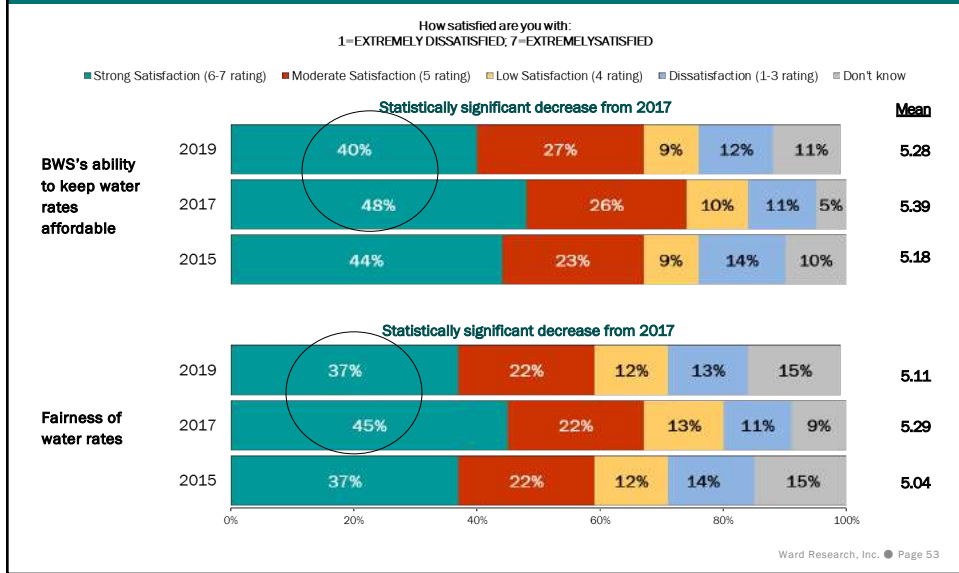
STRONG SATISFACTION: 6-7 RATING	2015	2017	2019
Accurate billing (bill payers only)	55%	60%	60%
Accessibility of employees	56%	56%	59%
Employees following through with what they say	54%	58%	58%
Accuracy of employees	57%	58%	58%
Efficiency of employees	58%	58%	58%
Repairing, maintaining, and replacing Oahu's water delivery system	54%	53%	53%
Informing residents how to conserve water and keep bills lower	52%	54%	53%
Protecting, managing, and sustaining Oahu's water resources	56%	54%	51%
Condition of Oahu's water delivery system	52%	48%	49%
Ability to keep water rates affordable	44%	48%	40%
Fairness of water rates	37%	45%	37%
Things they do to reach out to residents	31%	33%	32%

Denotes statistically significant decrease from 2017

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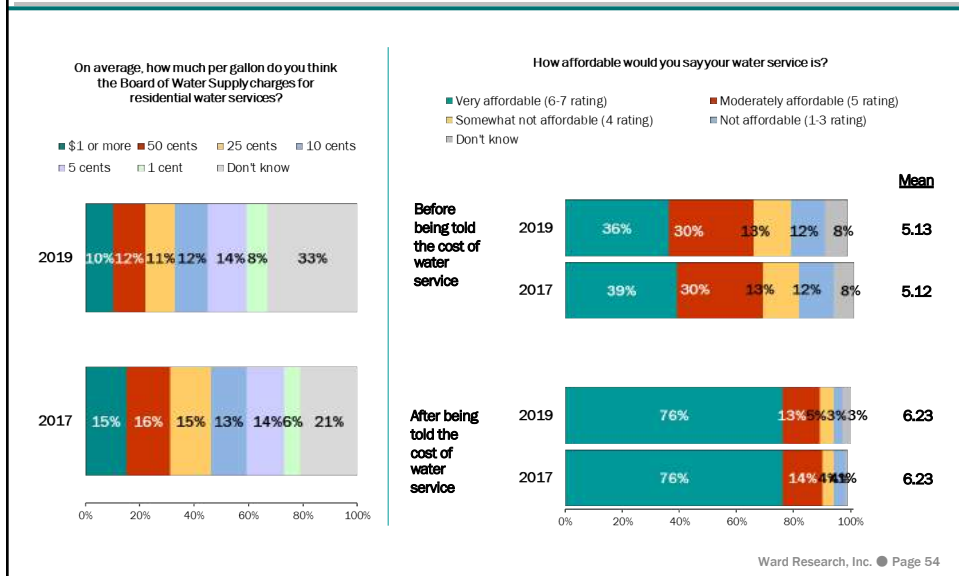
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PERCEPTIONS ABOUT RATES



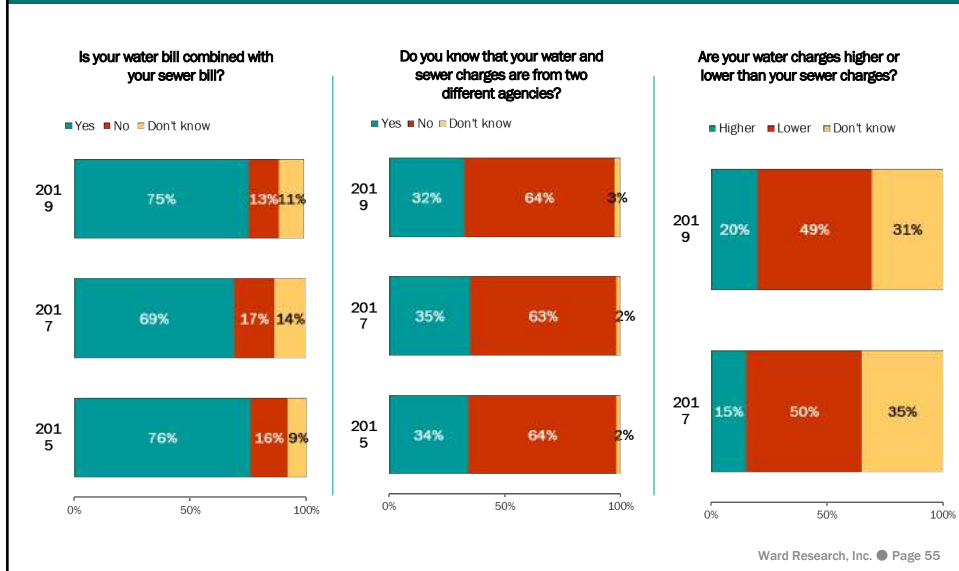
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PERCEPTIONS ABOUT THE AFFORDABILITY OF WATER SERVICE



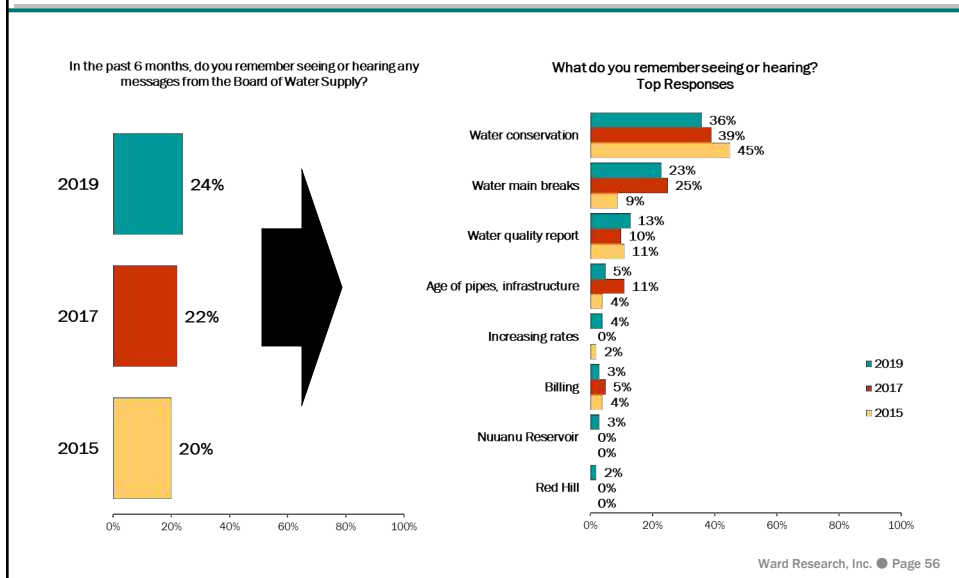
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DIFFERENTIATING WATER FROM SEWER – BILL PAYERS ONLY



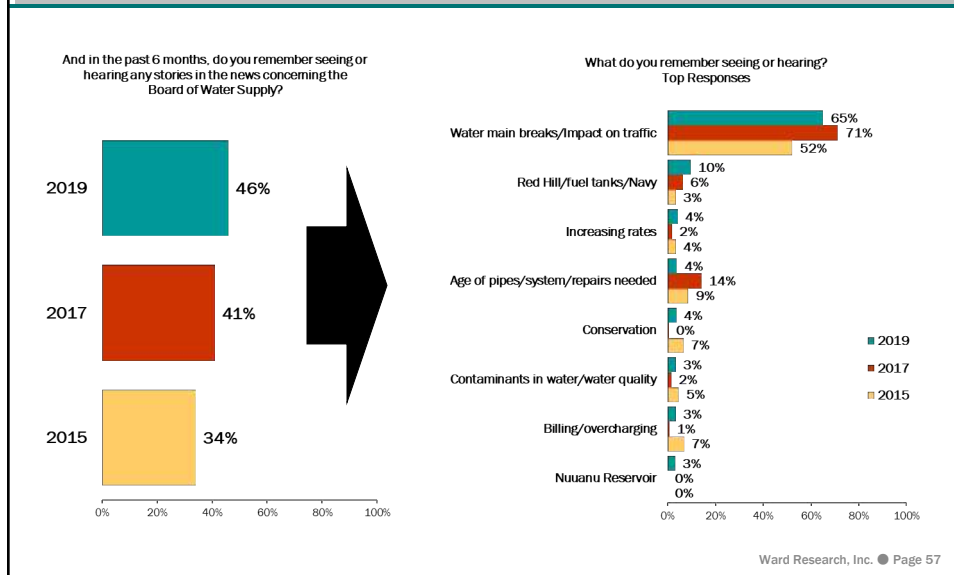
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MESSAGE RECALL, FROM THE BWS



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NEWS RECALL, ABOUT THE BWS



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ADDITIONAL FINDINGS

- BWS still among the most trusted sources of information about freshwater issues on Oahu, along with scientists
- Little to no change in awareness of BWS’s programs and activities since baseline measure; awareness is again highest for “repair and maintenance of the water system”
- Very few bill payers have contacted the BWS either about a bill (although, the proportion did increase) or something else in the past 6 months; more than half of those who did indicated strong satisfaction with how the communication was handled
- Levels of satisfaction with overall customer service provided by the BWS, as well as levels of satisfaction with BWS employees largely unchanged from past years

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SUMMARY OF FINDINGS

- Continued strong satisfaction with BWS, but note the downward trend in satisfaction among non-bill payers; bill payer satisfaction, however, is trending up
- Levels of satisfaction with attributes tested are fairly static compared to past years
- Two differences (declines) in levels of satisfaction from 2017 are statistically significant, both for attributes relating to rates: fairness of rates and ability of the BWS to keep rates down
- Recall of news stories about BWS and messages from the BWS ticked up, including about the rate increases and Red Hill fuel tanks, but those were far from being the stories or messages recalled most often
- Water service is still perceived to be more expensive than it actually is, including among bill payers
- Conclusions: Customers slow to recall news about rate increases but, based on ratings for attributes regarding rates, increase is affecting perceptions of – but not overall satisfaction with – the BWS

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QUESTIONS

Ward Research, Inc.

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City and County of Honolulu

Barry Usagawa
Water Resources Program Administrator

**HAIKU STAIRS DRAFT
ENVIRONMENTAL IMPACT
STATEMENT**

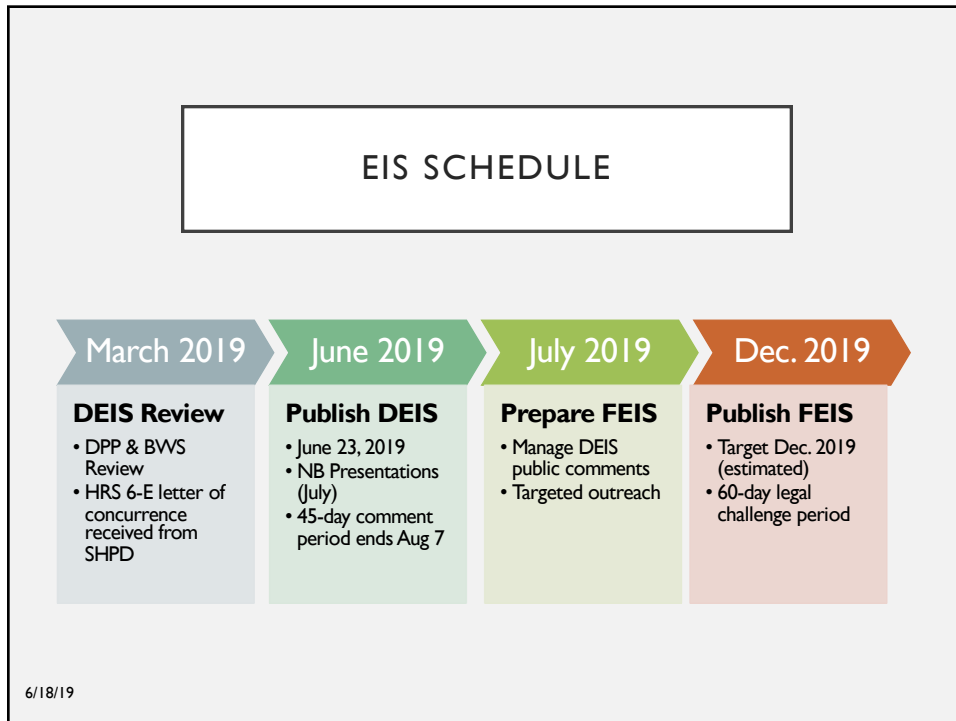
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Photo: David Brochie

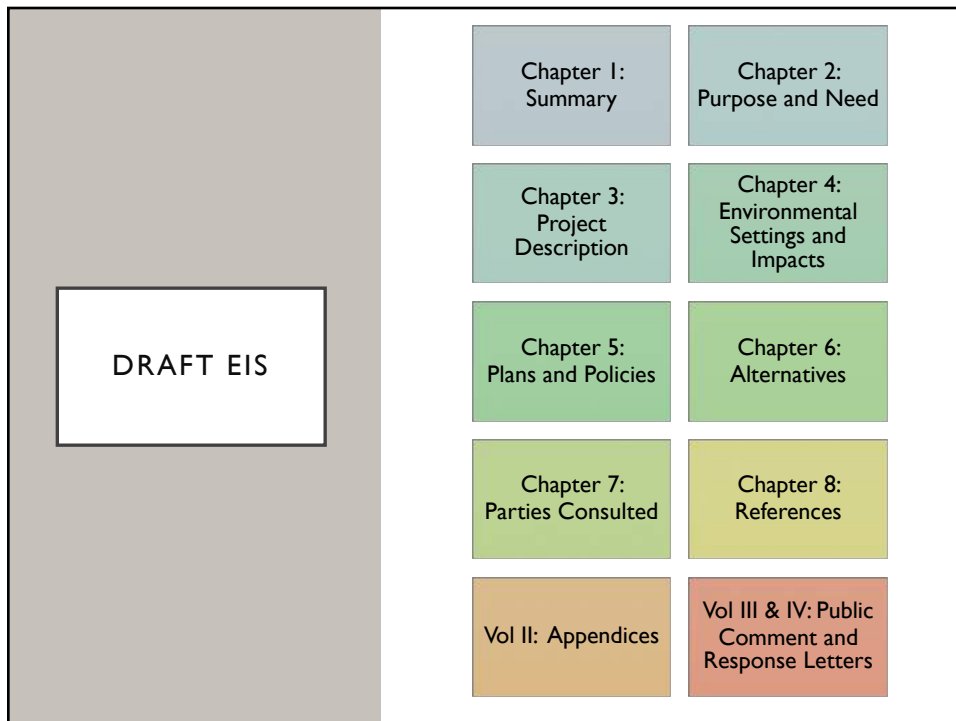
HA'IKŪ STAIRS DRAFT EIS
JULY 2019

Board of Water Supply

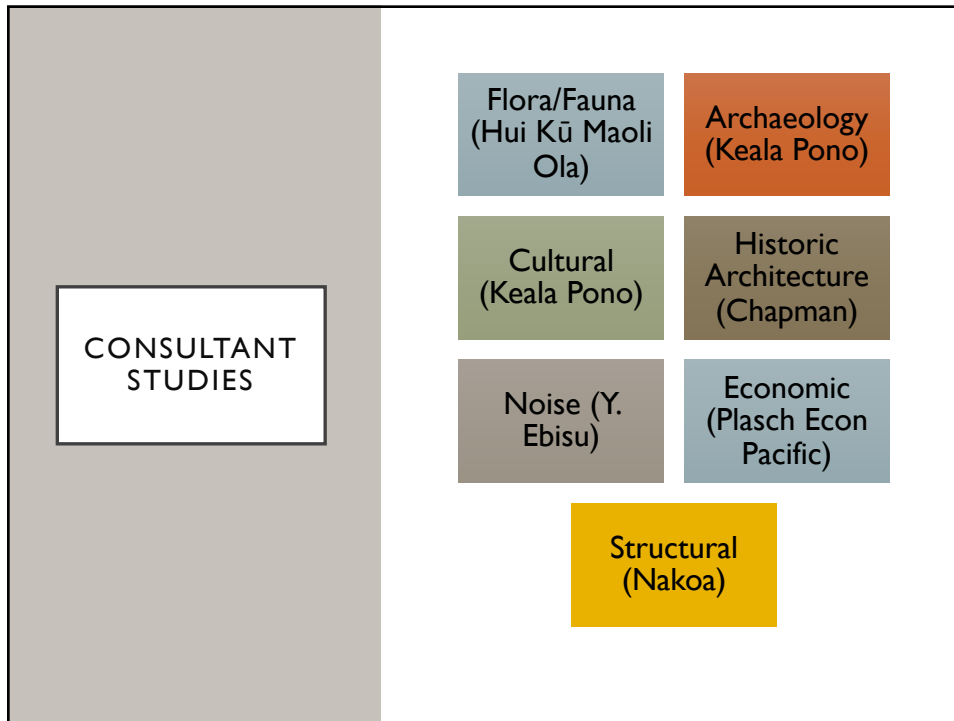
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BWS OBJECTIVE TO ELIMINATE LIABILITY

It is not in BWS' core mission to manage a recreational facility, yet they carry liability for Ha'ikū Stairs.

BWS can eliminate its organization's liability for Ha'ikū Stairs by:


- 1) Completely removing Ha'ikū Stairs
- 2) Conveying the property and Ha'ikū Stairs structure to another public agency or private interest

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PROPOSED ACTION & ALTERNATIVES

PROPOSED ACTION IS REMOVE HA'IKŪ STAIRS

- The EIS Chapter 3, Project Description describes removal of Ha'ikū Stairs.
- Extraction of all modules (front and back stairs). Platforms and structures to remain in place.
- EIS Chapter 4, Environmental Impacts evaluates the action of removal.



ALTERNATIVE OPTION TO KEEP STAIRS

- EIS provides equal consideration of an Alternative that retains the stairs.
- The Conveyance Alternative is thoroughly described and evaluated in EIS Chapter 6, Alternatives.

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EIS ALTERNATIVES CONSIDERED

No-Action

- BWS maintains ownership.
- No additional repairs, condition would degrade.
- Ongoing liability exposure. Costs detract from BWS core mission.

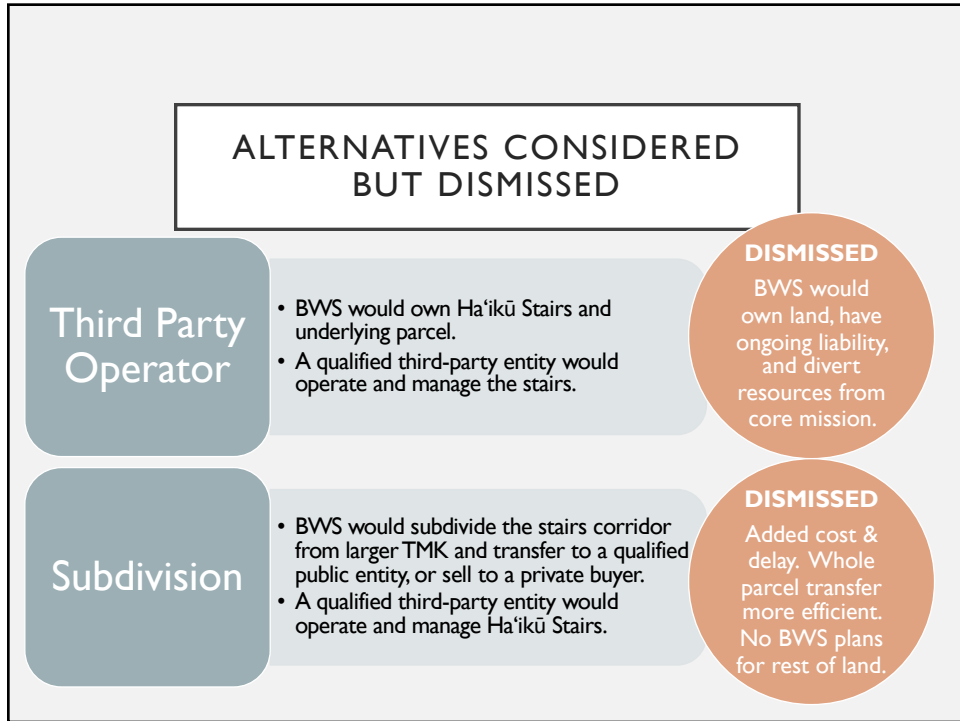
Partial Removal

- Remove approx. 1,000 feet of stairs up to first landing platform.
- Cost-effective solution to reduce liability to BWS from Ha'ikū.
- Ongoing liability - Hikers could still trespass in from Moanalua Valley.

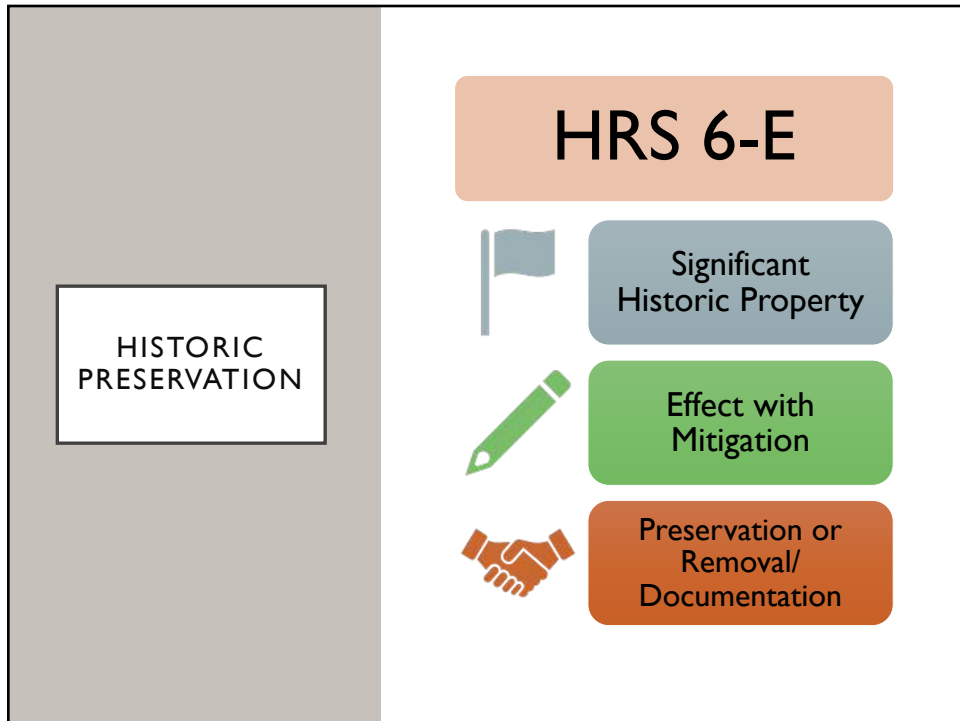
Conveyance

- Convey Ha'ikū Stairs and underlying land to public/private entity.
- Requires legal access route and managed access plan.
- Allows BWS to divest liability and focus on their core mission.

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ECONOMIC AND FISCAL IMPACTS

Projected impacts to City and State over a 21-year Analysis Period

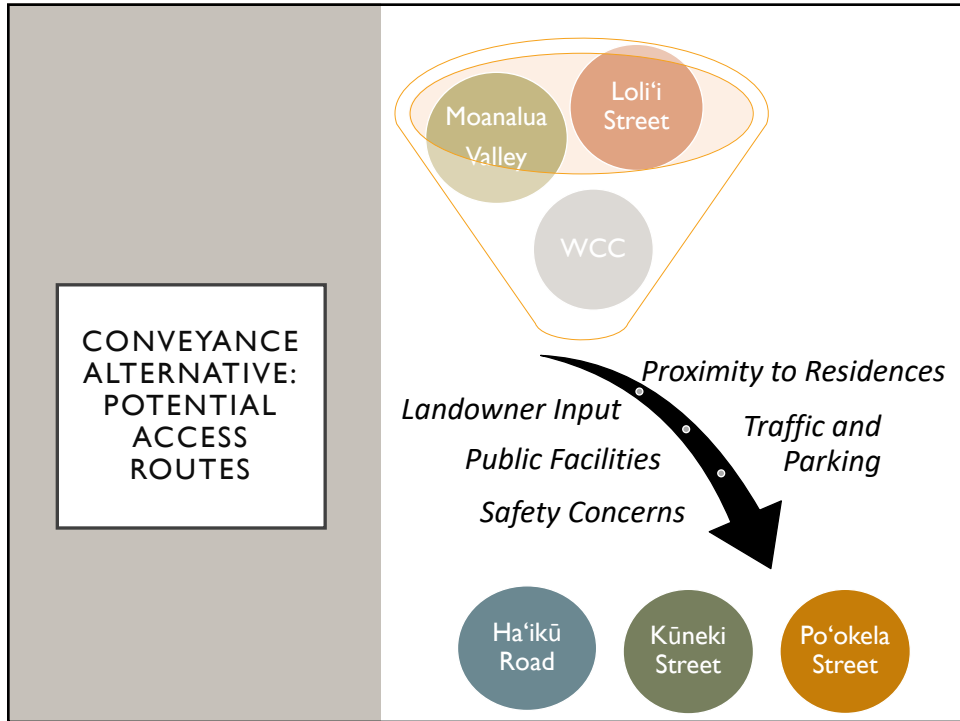
<p>NO-ACTION</p> <ul style="list-style-type: none"> No construction costs Security costs continue <p>PROPOSED ACTION</p> <ul style="list-style-type: none"> Cost of full stair removal <p>PARTIAL REMOVAL</p> <ul style="list-style-type: none"> Cost of partial stair removal <p>CONVEYANCE</p> <ul style="list-style-type: none"> Expenditure by agency is \$800,000 to improve access route. Cost to be reimbursed by operator. Operator pays for stair restoration. Hiking operation revenues offset City costs. Tax revenues to State. 	<div style="background-color: #4F81BD; color: white; padding: 10px; text-align: center; margin-bottom: 10px;"> No-Action </div> <div style="background-color: #C85A3D; color: white; padding: 10px; text-align: center; margin-bottom: 10px;"> Proposed Action </div> <div style="background-color: #6B8E23; color: white; padding: 10px; text-align: center; margin-bottom: 10px;"> Partial Removal </div> <div style="background-color: #F39C12; color: white; padding: 10px; text-align: center;"> Conveyance </div>	<ul style="list-style-type: none"> BWS cost \$4 million BWS cost \$942,000 BWS cost \$190,000 Income \$1.2 million
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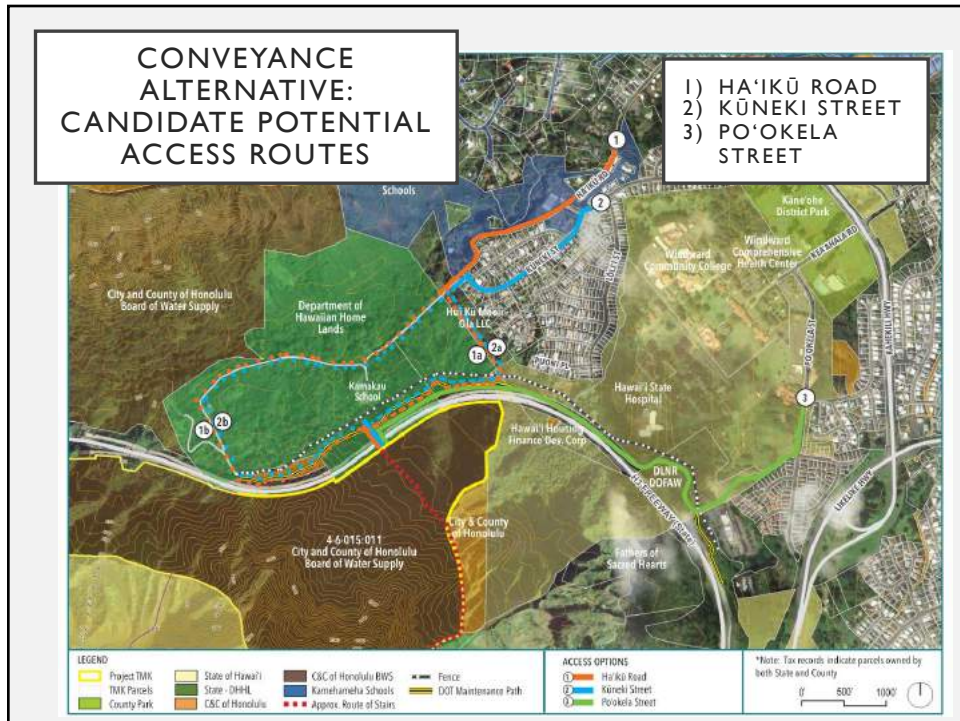
HA'IKŪ STAIRS PARCEL IS LAND LOCKED

**CONVEYANCE ALTERNATIVE:
POTENTIAL ACCESS ROUTES**

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ACCESS ROUTE RANKING

-  RANKING CRITERIA
-  Landowner discussions
-  Impacts to community
 - Traffic and parking
 - Proximity to residences
-  Availability of public facilities
-  Safe, feasible path to stairs

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HIGHEST RANKED ACCESS ROUTE: PO'OKELA STREET





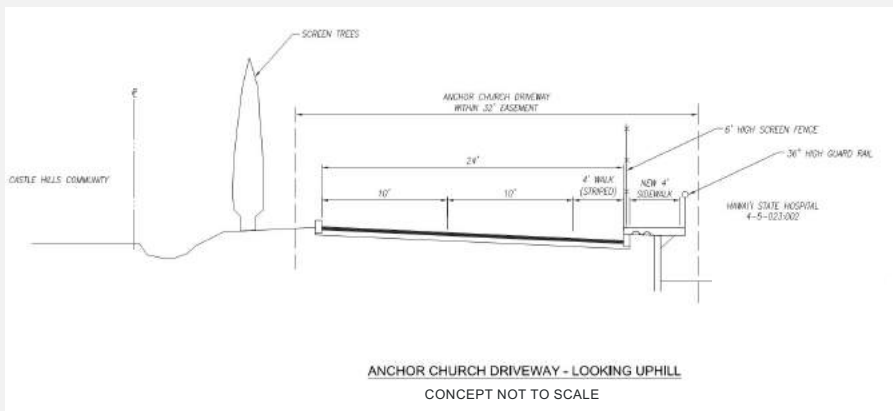
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HIGHEST RANKED ACCESS ROUTE (PO'OKELA STREET)



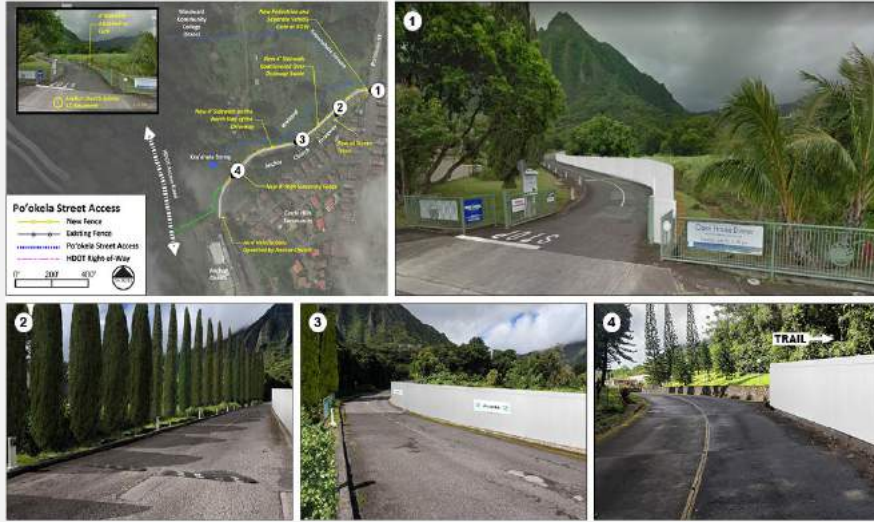
77

HIGHEST RANKED ACCESS ROUTE (PO'OKELA STREET)



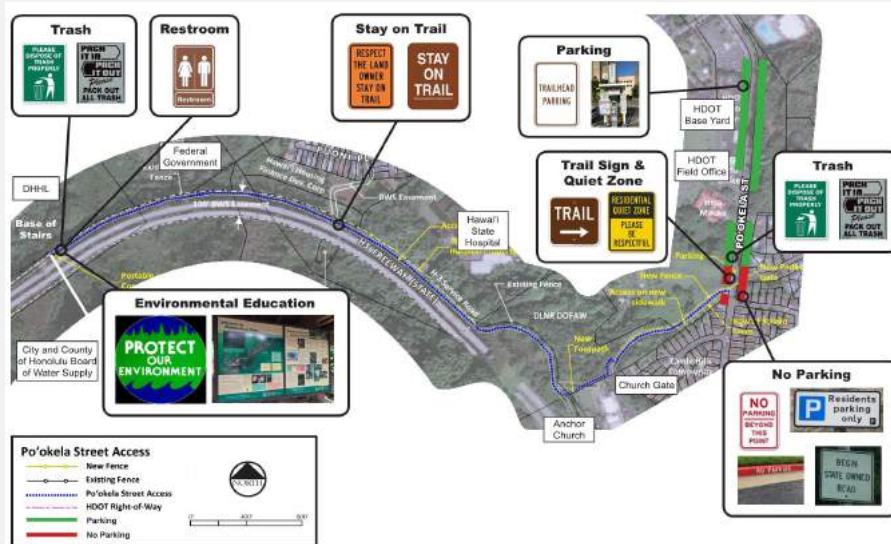
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HIGHEST RANKED ACCESS ROUTE (PO'OKELA STREET)

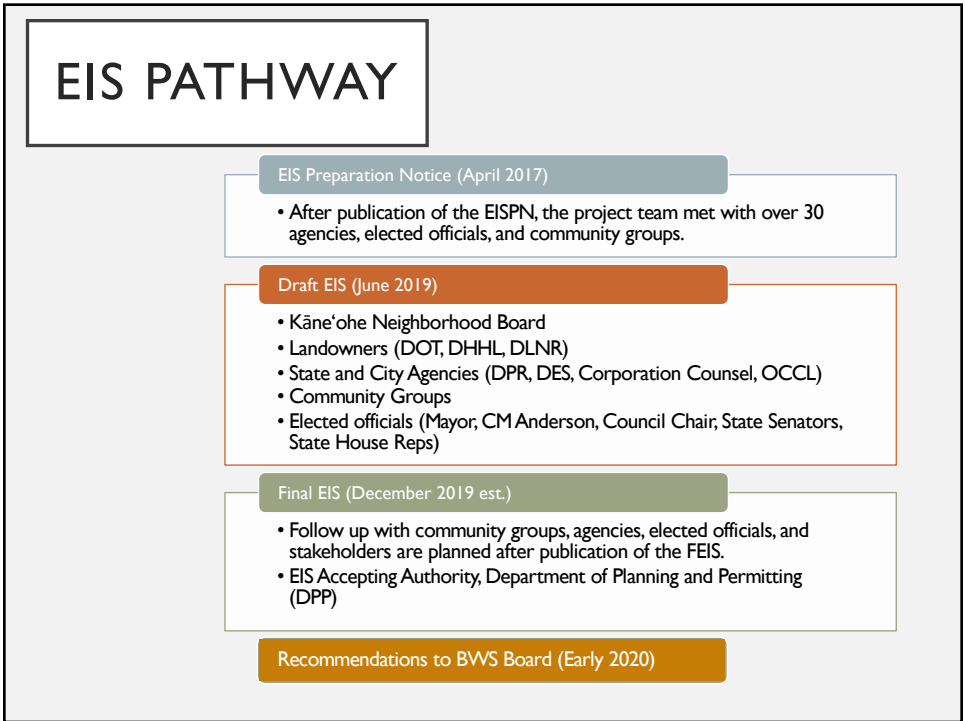


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PREFERRED POTENTIAL ACCESS ROUTE (PO'OKELA STREET)




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COMMENT PERIOD
June 23, 2019 - August 7, 2019



SUBMIT A COMMENT
<https://hbws.me/haiku>

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CONTACTS



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Dave Ebersold
Facilitator

SUMMARY AND NEXT STEPS

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Next Meeting


October 24, 2019
4:00 – 6:30 pm
Blaisdell Center, Maui Room

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