OAHU METROPOLITAN PLANNING ORGANIZATION

Citizen Advisory Committee
April 3, 2024

OAHU METROPOLITAN PLANNING ORGANIZATION

I. Call to Order

OAHU METROPOLITAN PLANNING ORGANIZATION

II. Approval of Minutes

OAHU METROPOLITAN PLANNING ORGANIZATION

III. Reports

OAHU METROPOLITAN PLANNING ORGANIZATION

IV. Old Business: NONE

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V. A. New Business

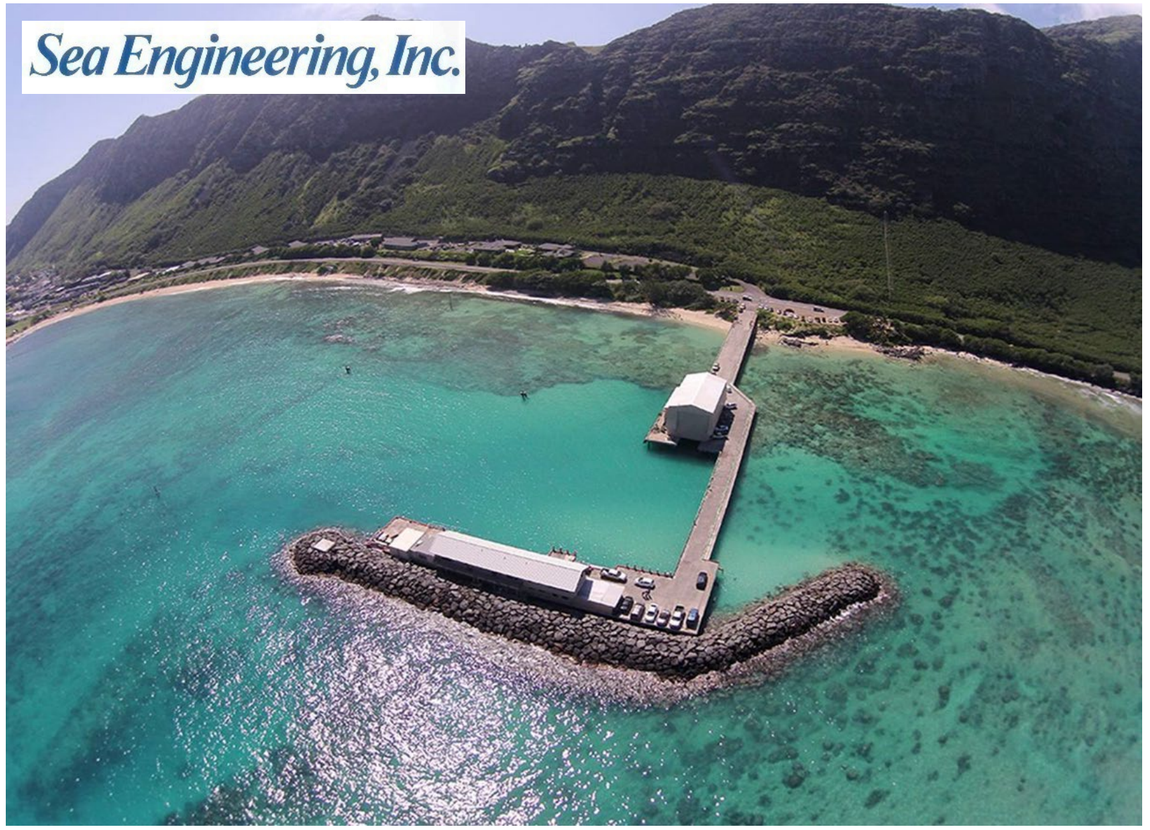
OAHU METROPOLITAN PLANNING ORGANIZATION

V. A. Overall Work Program (OWP) Presentation: Planning for Improved Resilience to Coastal Hazards through Green Infrastructure

Feasibility Study Planning for Improved Resilience to Coastal Hazards through Green Infrastructure at Punaluu, Oahu

Project Summary

Citizen Advisory Committee Meeting
April 3, 2024



Makai Research Pier
Waimanalo, Hawaii

863 N. Nimitz Hwy.
Honolulu, Hawaii

Santa Cruz, California

www.seaengineering.com

Project Goals and Objectives

- The purpose of this study is to conduct in-depth analyses at Punaluu Beach Park and develop conceptual design alternatives to address the problems at the beach park and achieve the project objectives including:
  - Restore the beach at Punaluu Beach Park
  - Protect Kamehameha Highway from Flooding and Erosion
  - Improve Community Resiliency to Sea Level Rise and Coastal Storms
  - Provide Recreational Resources and Native Habitat

Project Tasks and Analyses

- The project consisted of the following work tasks and analyses:
  - Beach Condition Assessment and Topographic Survey of the Study Area
  - Historical Shoreline Analysis
  - Wave and Sea Level Rise Numerical Inundation Modeling
  - Offshore Sand Source Investigations
  - Offshore Sand Recovery Methods
  - Marine Biology and Water Quality Surveys
  - Development of Beach Restoration Alternatives

Key Findings from this Study

- The shoreline at Punaluu Beach Park is chronically eroding with historical erosion rates between -2.0 and -3.0 ft/yr. These erosion rates are expected to increase with rising sea levels as more wave energy reaches the shoreline.

- A broad shallow fringing reef protects the shoreline from the highly energetic offshore waves typical for this coastline. As sea level rises, the effectiveness of the reef at reducing waves decreases and backshore inundation increases drastically with both higher water levels and waves at the shoreline. This is shown through numerical modeling results.

- A suitable offshore sand source exists about 2,000 ft offshore of Punaluu Beach Park with sand characteristics that match well with the existing beach sand.

- The most viable method to recover the sand and transport it to shore is to use a hydraulic suction pump deployed off a barge and pump the sand to shore through a temporary pipeline. Current regulation requires that the sand be dewatered prior to placement on the beach.

Key Findings from this Study

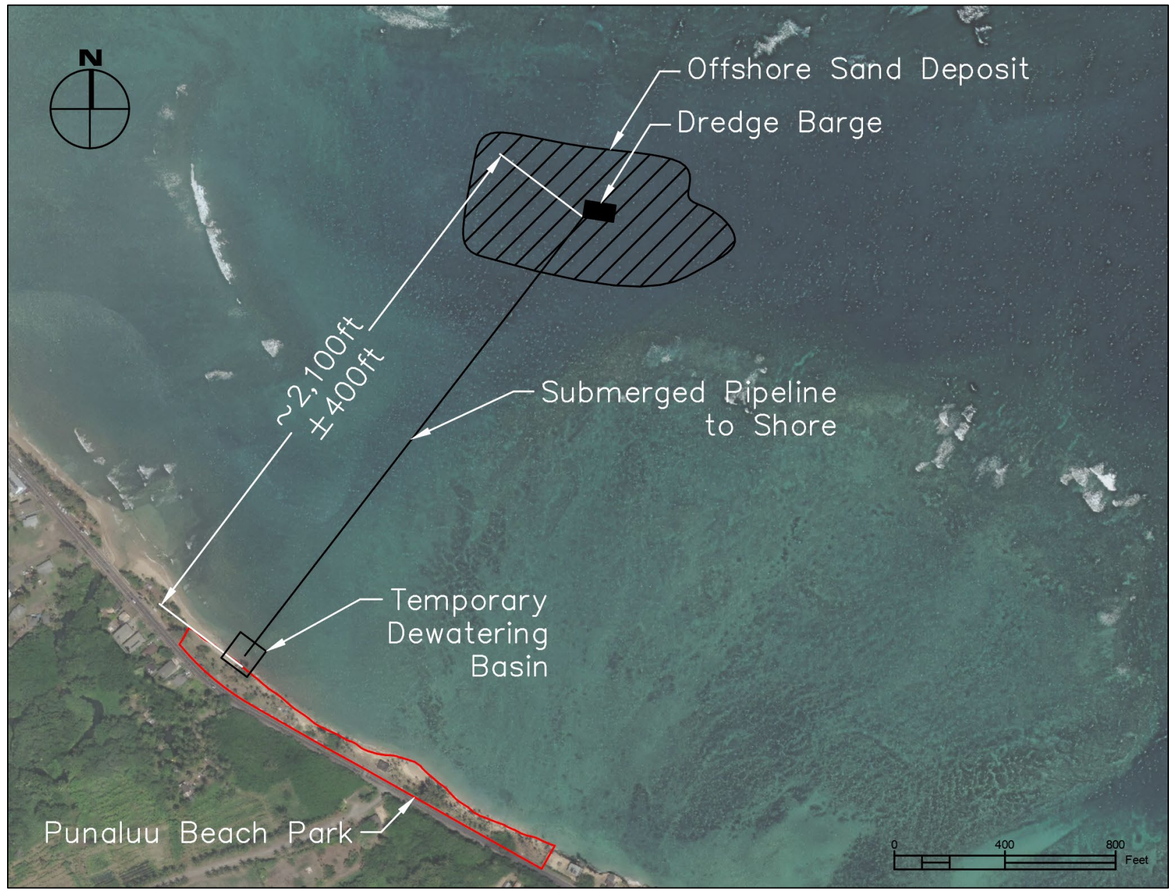
- While the source is reasonably close to shore, the windward coast of Oahu is one of the most energetic wave environments in Hawaii which makes the sand recovery challenging. Because of the challenges and high cost to recover sand it is recommended that stabilizing structures (particularly headland type structures) be used in conjunction with beach nourishment to prevent the need for re-nourishment to maintain the beach.

- Five (5) concept beach alternatives are proposed for Punaluu Beach Park along with ROM cost estimates. These concepts are considered nature-based or hybrid nature-based solution and include:
  - Alternative 1 – Beach Nourishment
    - » ROM Cost: $14,835,000
  - Alternative 2 – Beach Nourishment with Buried Revetment
    - » ROM Cost: $22,396,000
  - Alternative 3 – Stabilized Pocket Beaches
    - » ROM Cost: $32,910,000
  - Alternative 4 – Partially Stabilized Pocket Beaches
    - » ROM Cost: $28,539,000
  - Alternative 5 – Hybrid Stabilized Pocket Beaches
    - » ROM Cost: $31,210,000

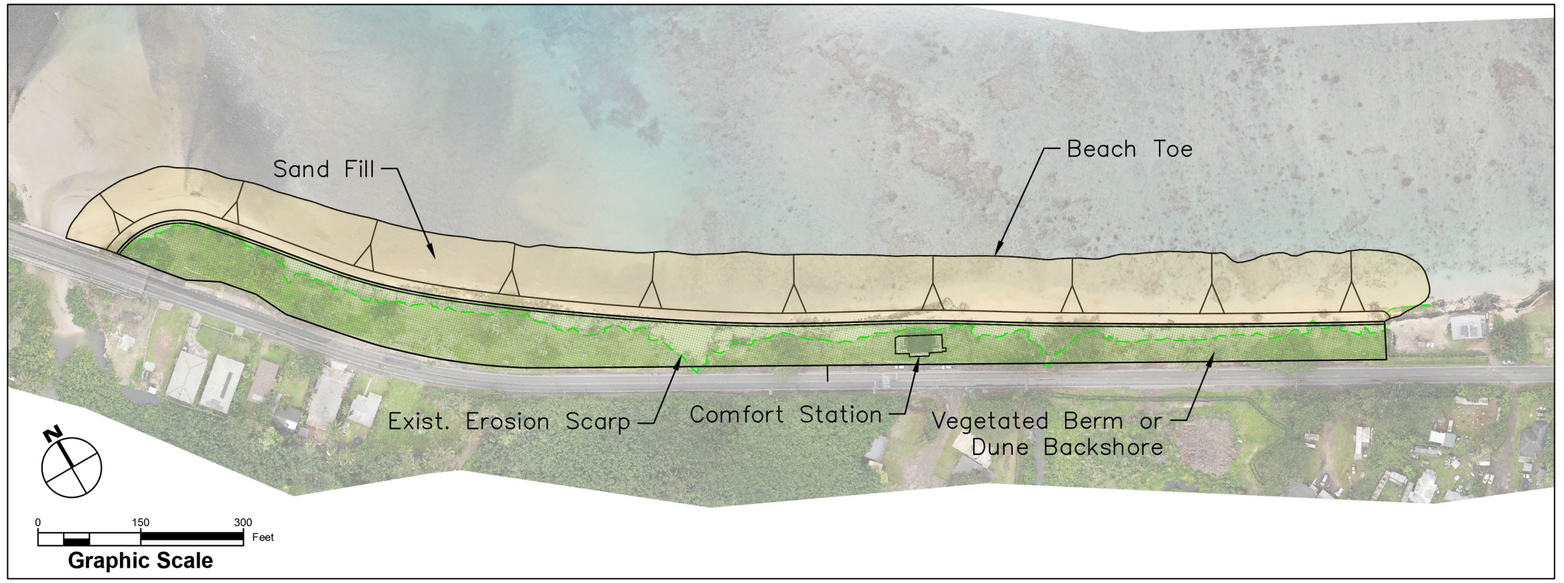
Key Findings from this Study

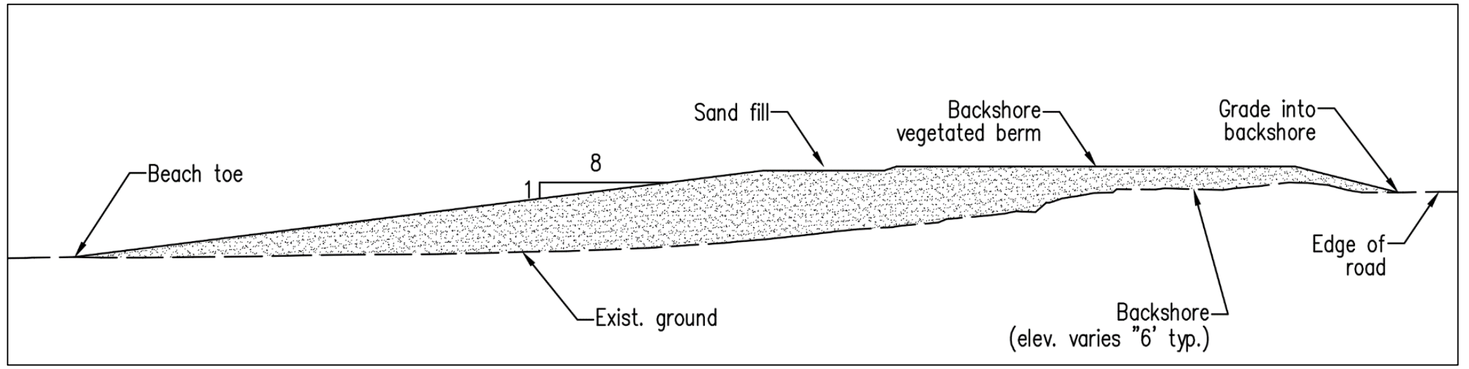
- All concepts were modeled under a combination of existing/future sea level and wave conditions. The modeling results show that the alternatives reduce the expected wave inundation at the beach park compared to existing conditions.

Offshore Sand Recovery



Alternative 1 - Beach Nourishment





Alternative 1 - Beach Nourishment

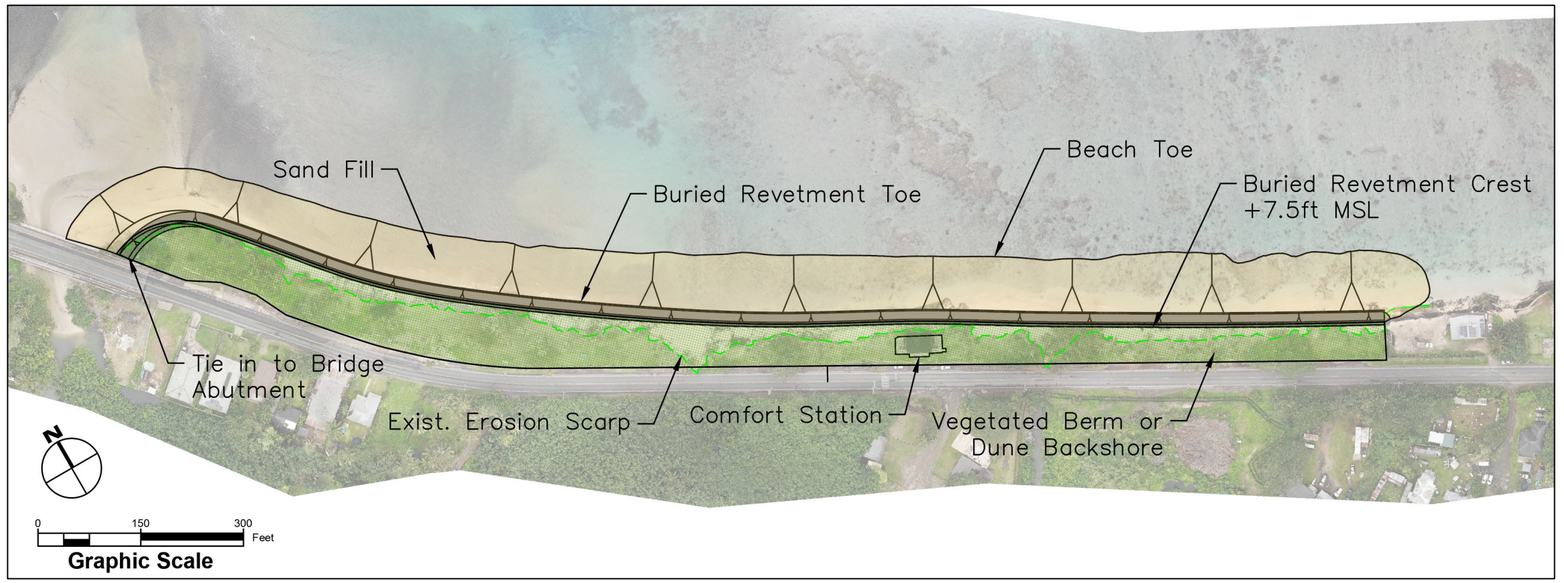
<u>Advantages</u>

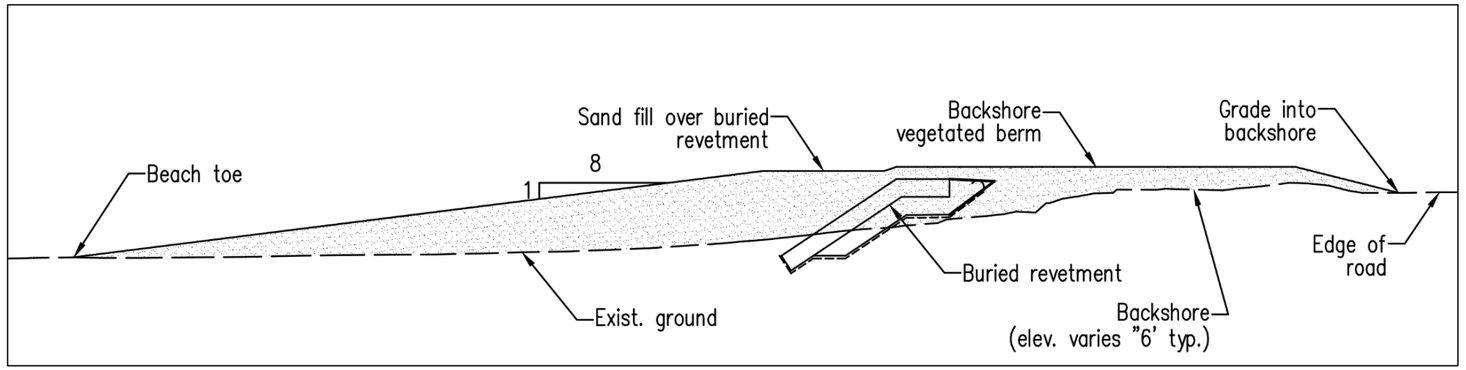
- Sand fill would provide a natural buffer from storm waves and high-water levels.
- Improves lateral shoreline access.
- Improves access to and from the water.
- Provides wide sand beach for recreation.

<u>Disadvantages</u>

- Sand fill for beach nourishment would be subject to chronic and likely accelerating erosion occurring in the project area, and thus is not expected to remain in the medium to long term (15 to 25 years).
- Periodic beach re-nourishment may be required to maintain the beach.
- Because there are no stabilizing structures, rapid, catastrophic sand loss is possible due to severe wave events.
- Additional offshore sand surveys would be required to determine availability of offshore sand for follow-up re-nourishment activities.

Alternative 2 - Beach Nourishment with Buried Revetment





Alternative 2 - Beach Nourishment with Buried Revetment

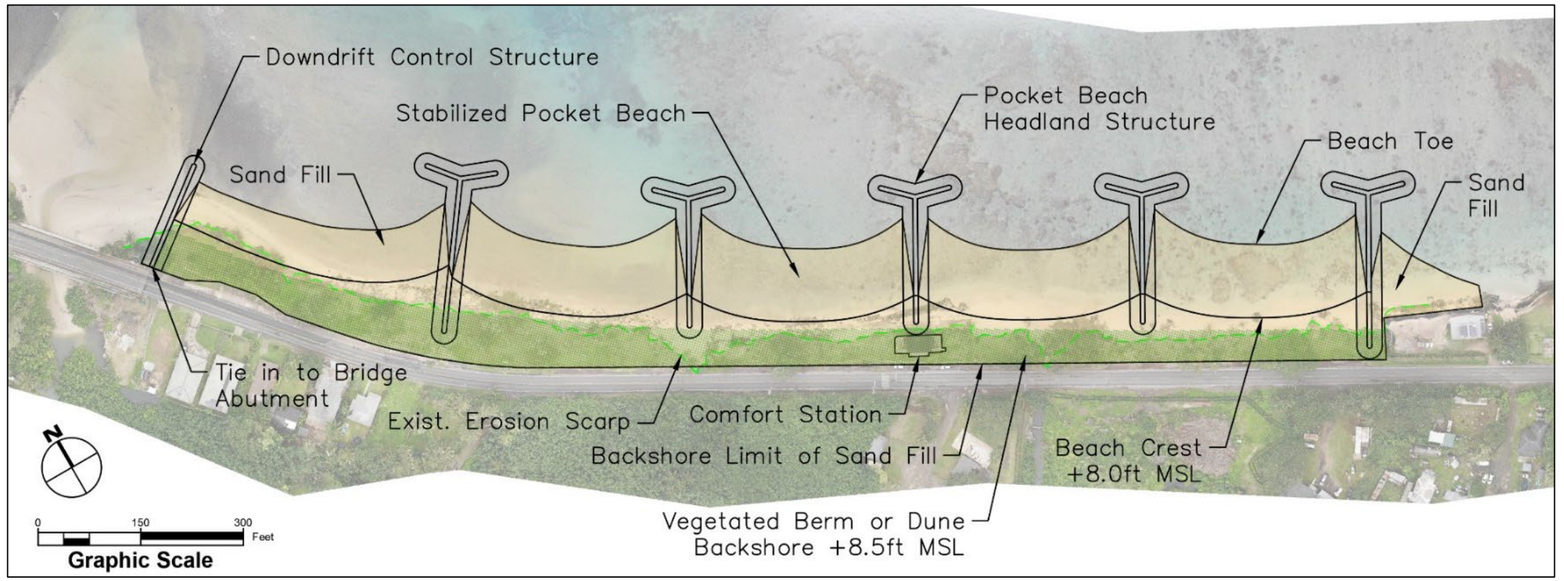
<u>Advantages</u>

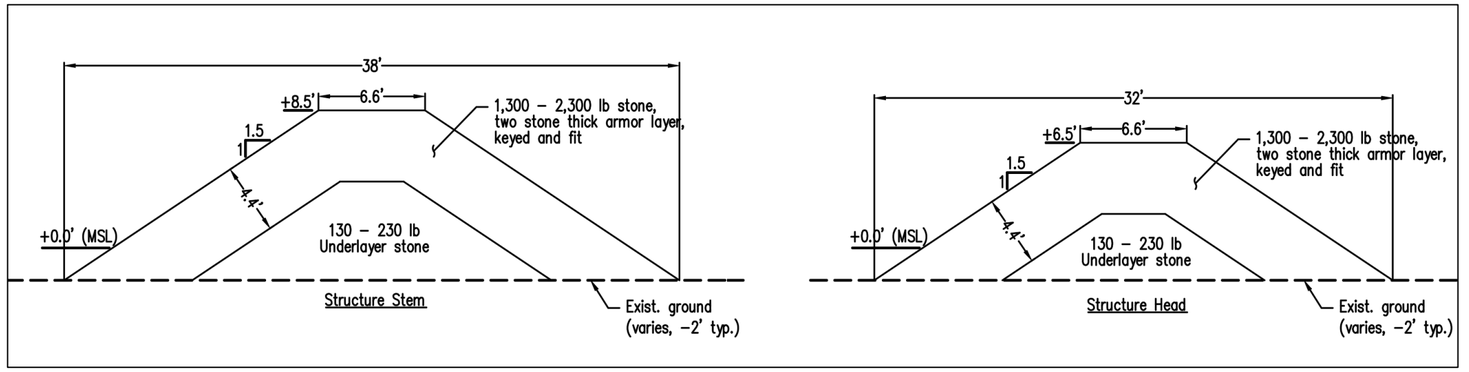
- Improves lateral shoreline access.
- Improves access to and from the water.
- Provides wide beach for recreation.
- Buried revetment would protect the backshore and highway from shoreline erosion.

<u>Disadvantages</u>

- Sand fill for beach nourishment would be subject to chronic and likely accelerating erosion occurring in the project area, and thus is not expected to remain in the medium to long term (15 to 25 years).
- Because there are no stabilizing structures, rapid, catastrophic sand loss is possible due to severe wave events.
- Periodic beach re-nourishment may be required to maintain the beach.
- Continued erosion of the sand beach could eventually lead to exposure of the revetment, leaving the shoreline armored and without a restored sand beach.
- Additional offshore sand surveys would be required to determine availability of offshore sand for follow-up re-nourishment activities.
- Higher cost than standalone beach nourishment.
- Sourcing suitable stone size and quality may be challenging.

Alternative 3 - Stabilized Pocket Beaches





Alternative 3 - Stabilized Pocket Beaches

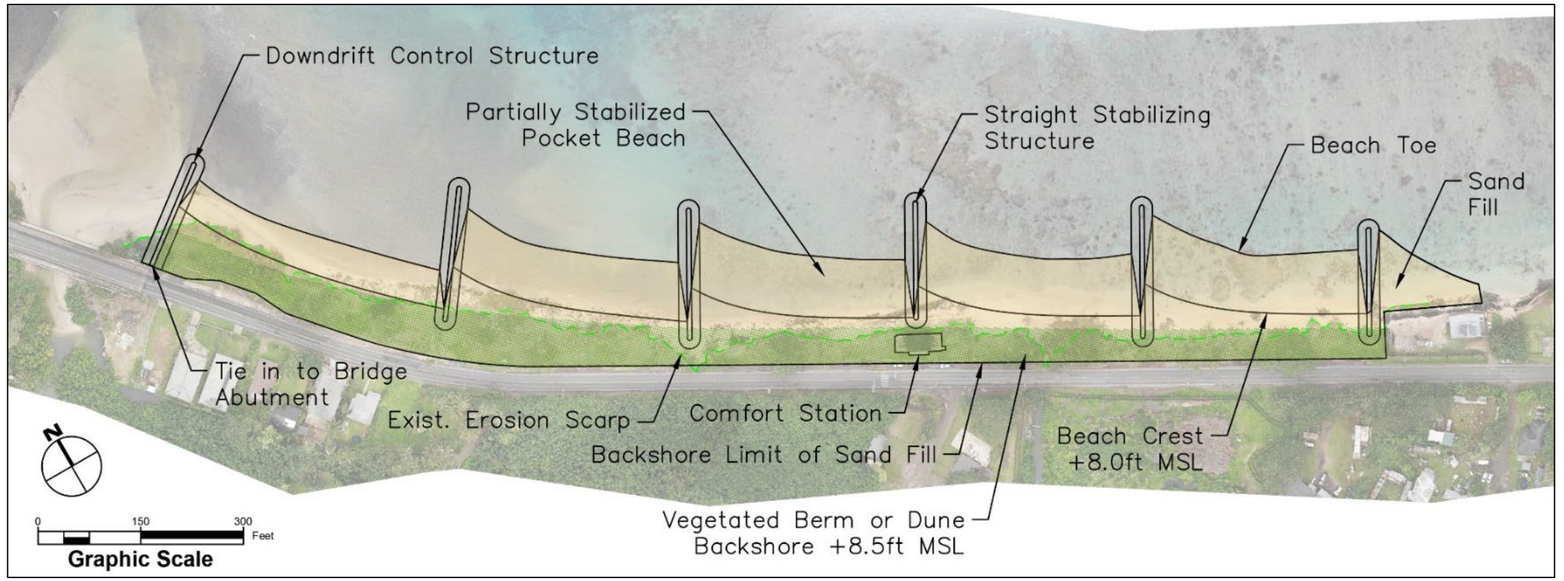
<u>Advantages</u>

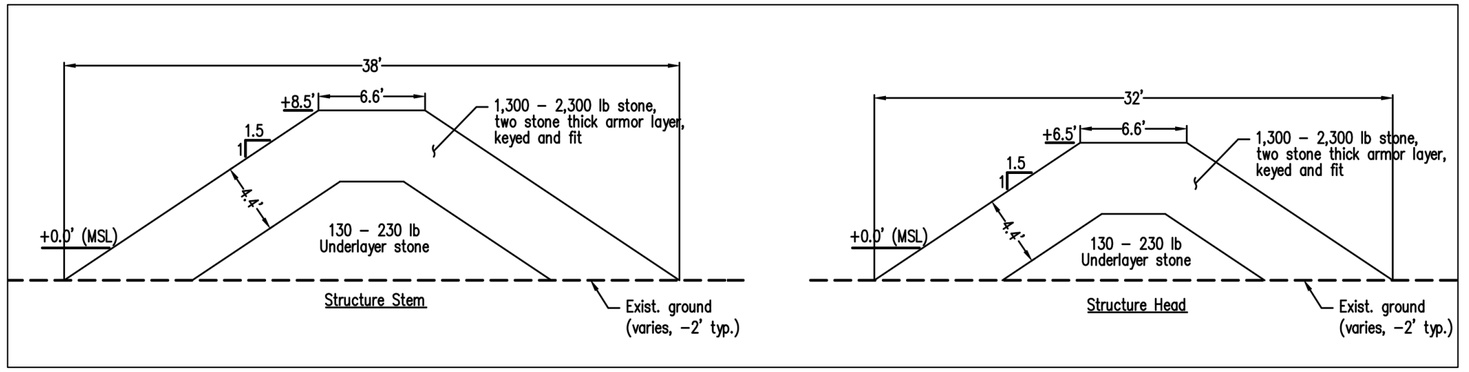
- Improves lateral shoreline access.
- Improves access to and from the water.
- Provides a wide beach for recreation.
- Sand fill is protected from erosion, minimizing or possibly eliminating need for renourishment maintenance.
- Structures may provide improved marine habitat and biomass/biodiversity.

<u>Disadvantages</u>

- Larger footprint than standalone beach nourishment.
- Higher cost than standalone beach nourishment.
- Sourcing suitable stone size and quality may be challenging.
- Alters view plane and character of beach.

Alternative 4 - Partially Stabilized Pocket Beaches





Alternative 4 - Partially Stabilized Pocket Beaches

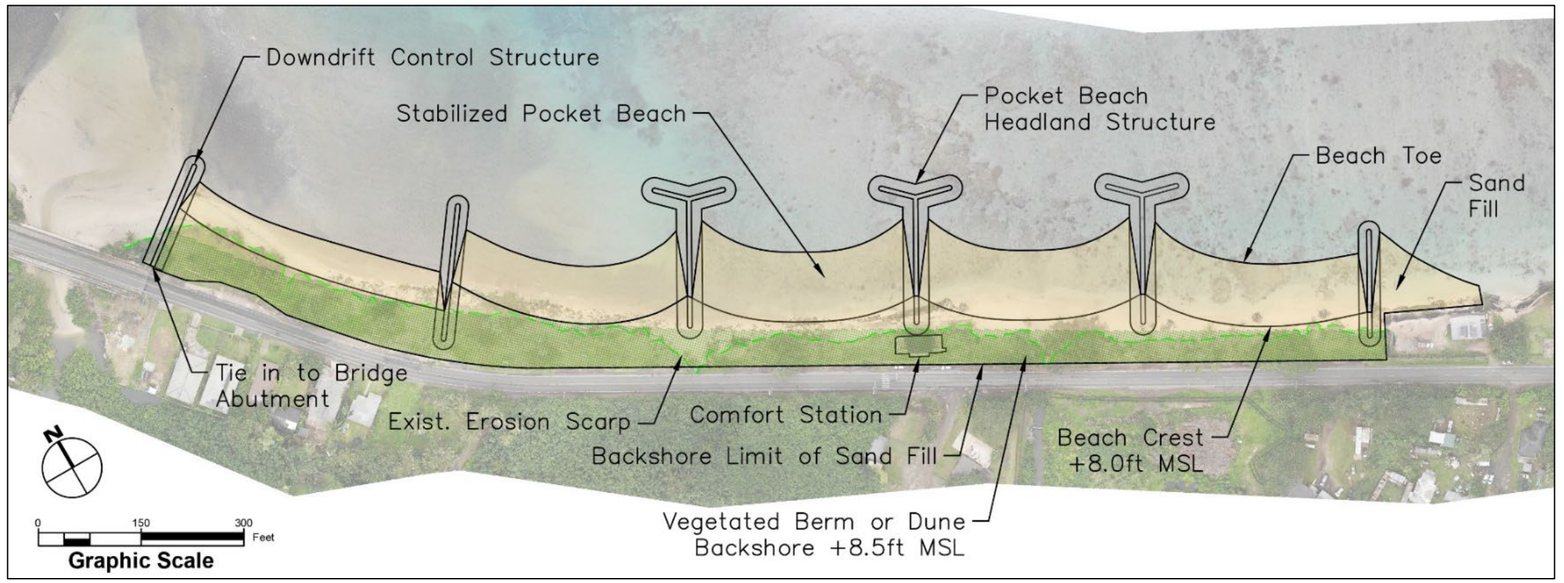
<u>Advantages</u>

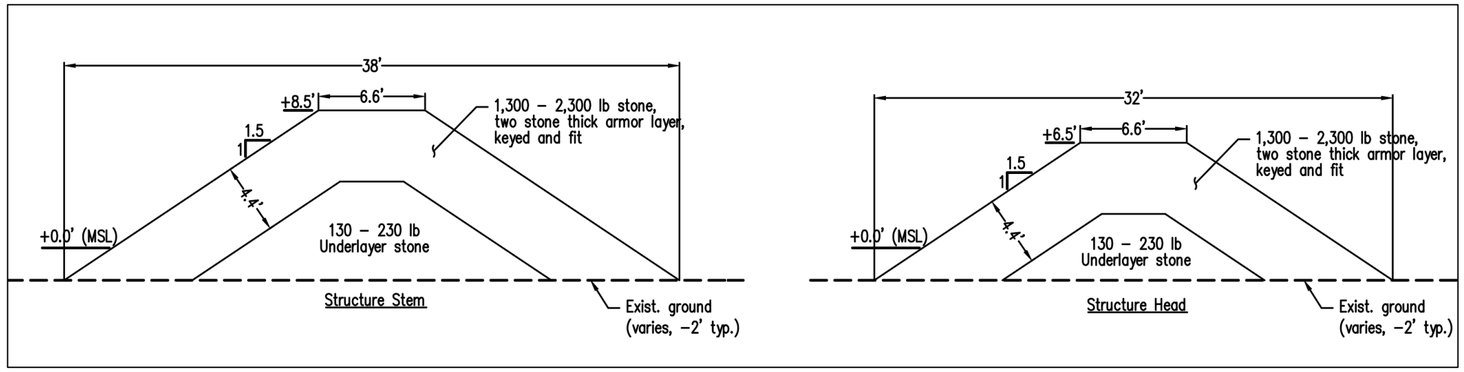
- Improves lateral shoreline access.
- Improves access to and from the water.
- Provides wide beach for recreation.
- Sand fill is partially protected from erosion, reducing the frequency of renourishment maintenance.
- Structures may provide improved marine habitat and biomass/biodiversity.

<u>Disadvantages</u>

- Larger footprint than standalone beach nourishment.
- Rip currents may develop along structure stems posing a risk to swimmers.
- Sand may still be lost from the system.
- Higher cost than standalone beach nourishment.
- Sourcing suitable stone size and quality may be challenging.
- Alters view plane and character of beach.

Alternative 5 - Hybrid Stabilized Pocket Beaches





Alternative 5 - Hybrid Stabilized Pocket Beaches

<u>Advantages</u>

- Improves lateral shoreline access.
- Improves access to and from the water.
- Provides wide beach for recreation.
- Sand fill is well protected from erosion, minimizing the need for renourishment maintenance.
- Structures may provide improved marine habitat and biomass/biodiversity.

<u>Disadvantages</u>

- Larger footprint than standalone beach nourishment.
- Rip currents may develop along structure stems posing a risk to swimmers.
- Sand may still be lost from the system.
- Higher cost than standalone beach nourishment.
- Sourcing suitable stone size and quality may be challenging.
- Alters view plane and character of the beach.

QUESTIONS?

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Requested Action: Recommend the Policy Board approve the presentation as evidence that the work was carried out, submit documentation of the work completed to the USDOT for approval, and incorporate study findings into the metropolitan transportation planning process.

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V. B. TIP FFYs 2025-2028 Public Review

Transportation Improvement Program (TIP)

- Short-term list of all ground transportation projects and programs
- Covers a period of 4 years
- Updated every 3 years
- Revised at least twice a year or as needed

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TIP FFYs 2025-2028

- Contains 92 projects and programs
    - 80 projects and programs were carried over from the current TIP FFYs 2022-2025
    - 12 new projects from the Oahu Regional Transportation Plan (ORTP)

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Key Requirements

- Consistent with the Oahu Regional Transportation Plan (ORTP)
- Title VI/Environmental Justice (T6/EJ) Analysis
- Financial Plan (Fiscal Constraint)
- Intergovernmental Review (IGR) and Public Review

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Consistency with the Oahu Regional Transportation Plan (ORTP)

- For the first time, we evaluated all 92 projects and programs

- The average score for existing and new projects and programs was nearly identical at 34 points

    - Existing - Scores ranged from 4 points to 58.5 points

    - New – Scores ranged from 30 points to 45.5 points

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Title VI/Environmental Justice (T6/EJ) Analysis

- Assesses the impact of projects in minority and low-income communities
- Ensures there are no significant differences between T6/EJ and Non-T6/EJ communities

T6/EJ Financial Summary*	T6/EJ Block Groups	Non-T6/EJ Block Groups	T6/EJ Block Groups vs. Non-T6/EJ Block Groups
Est. Total Project Expenditures	$5,162,516,636	$6,672,376,364	-$1,509,859,728
% Est. Total Project Expenditures	44%	56%	-13%
Total Population (2020)	591,111	884,709	-293,598
Per Capita Expenditures	$8,734	$7,542	$1,192
* For the OC16 Honolulu Rail Transit Project, rail stations were used as the specific geography			

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Financial Plan (Fiscal Constraint)

- Demonstrates projects can be implemented using committed, available, or reasonably available revenue sources

Revenue: FFY 2025-2028 (x1000)			
Funding Category	**Total**	**Federal**	**Local**
§5307/§5340	$362,248	$287,317	$74,931
§5309	$2,410,341	$618,741	$1,791,600
§5310	$8,681	$7,070	$1,611
§5329	$2,654	$2,123	$531
§5337	$7,327	$6,229	$1,098
§5339	$17,979	$15,283	$2,696
§5339 (c)	$113,442	$90,750	$22,692
Bridge OS	$10,800	$8,640	$2,160
FHWA Grant	$287,153	$177,837	$109,316
GRANT TO §5307	$86,000	$68,800	$17,200
HDOT TO §5307	$50,000	$40,000	$10,000
HIP-BFP	$364,243	$146,919	$217,324
HIP-CPF/CDS	$4,350	$3,480	$870
HSIP	$11,895	$9,995	$1,900
Local	$114,239	$0	$114,239
NHPP	$388,557	$336,448	$52,109
STBG	$158,491	$146,963	$11,528
TA	$2,500	$2,000	$500
TA TO §5307	$12,000	$9,600	$2,400
TOTAL	$4,412,900	$1,978,195	$2,434,705

Expenditures: FFY 2025-2028 (x1000)			
Project Phase	**Total**	**Federal**	**Local**
HRTP	$2,464,341	$663,741	$1,800,600
PLN	$3,604	$2,880	$724
PE1	$48,592	$31,241	$17,351
PE2	$74,137	$31,612	$42,525
PE1/PE2	$7,500	$3,500	$4,000
DES	$12,563	$8,640	$3,923
ROW	$17,786	$11,174	$6,612
ADVCON	$0	$395,400	-$395,400
CON	$1,355,055	$485,032	$870,023
EQP	$230,650	$188,912	$41,738
OPR	$134,982	$108,634	$26,348
INSP	$63,690	$43,429	$20,261
ADVCON (PE)	$0	$4,000	-$4,000
TOTAL	$4,412,900	$1,978,195	$2,434,705

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New Projects

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OS-25-01 Kamehameha Highway (Route 83), Bridge Rehabilitation, Kahawainui Stream-Laiewai Bridge

- **Description:** Rehabilitate the substructure (concrete piles), repairing the deck (concrete slab) and performing preventative maintenance (clean bridge and remove vegetation growth)

- **Funding source:** Bridge Formula Funds

- **Estimated total project cost:** $3.3 million

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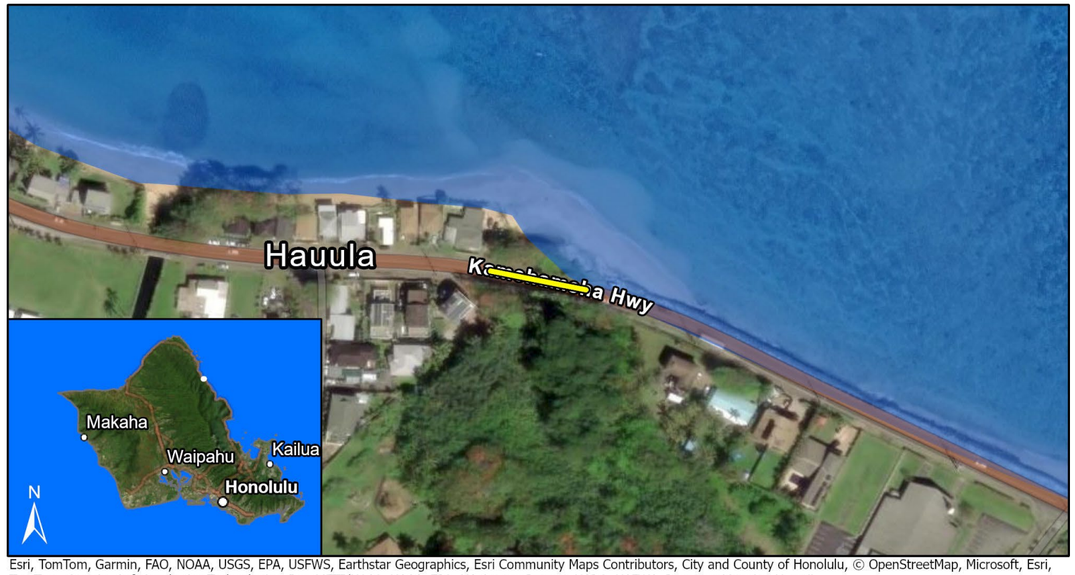
OS-25-02 Kamehameha Highway (Route 83), Bridge Rehabilitation, Maheiwi Stream Bridge

- **Description:** Rehabilitate the substructure (concrete pier caps and piles) and deck (concrete slab); performing general preventative maintenance (clean bridge and remove vegetation growth)

- **Funding source:** Bridge Formula Funds

- **Estimated total project cost:** $2.1 million



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OS-25-03 Interstate Route H-1, Drainage Improvements, Vicinity of Radford Drive

- **Description:** Address settlement and lateral spreading with on-going pavement and embankment repair and construction

- **Funding source:** National Highway Performance Program Funds

- **Estimated total project cost:** $5.3 million

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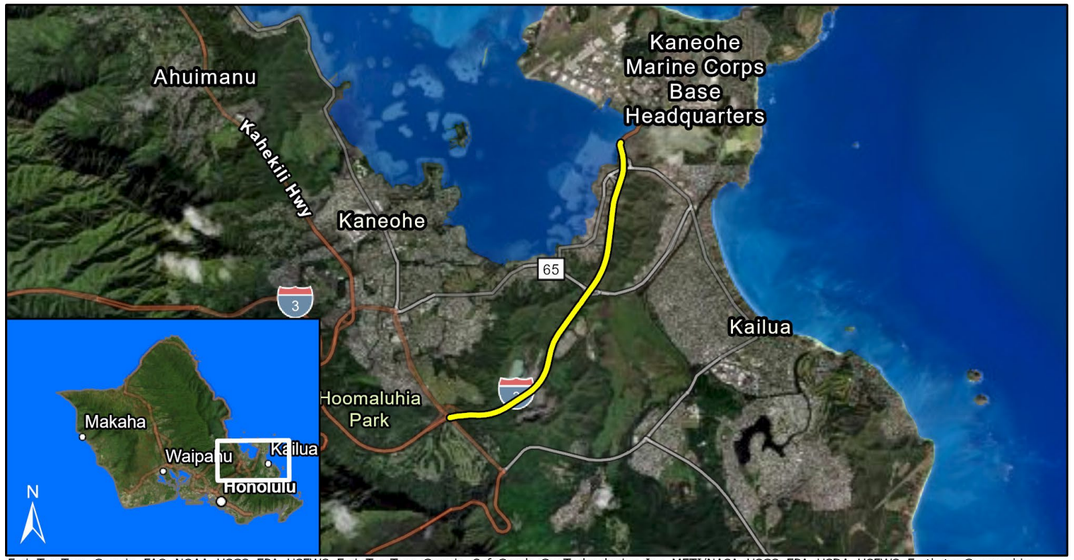
OS-25-04 Interstate Route H-3, Safety Improvements, Kionaole Road Overpass to Kaneohe Marine Corp Air Station Main Gate

- **Description:** Scope includes, but is not limited to the installation of median and shoulder milled rumble strips, pavement markings, and signing

- **Funding source:** Highway Safety Improvement Program Funds

- **Estimated total project cost:** $3.5 million



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OS-25-05 Likelike Highway (Route 63), Slope Stabilization, Vicinity of Kalihi Elementary School to Vicinity of Emmeline Place

- **Description:** Install a drilled shaft wall to impede slope movement
- **Funding source:** National Highway Performance Program Funds
- **Estimated total project cost:** $11.0 million

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OS-25-06 Farrington Highway (Route 93), Rockfall Protection, Vicinity of Yokohama Beach

- **Description:** Scope involves using an innovative solution with driven steel anchors and grade-beam type concrete grid facings

- **Funding source:** National Highway Performance Program Funds

- **Estimated total project cost:** $7.0 million

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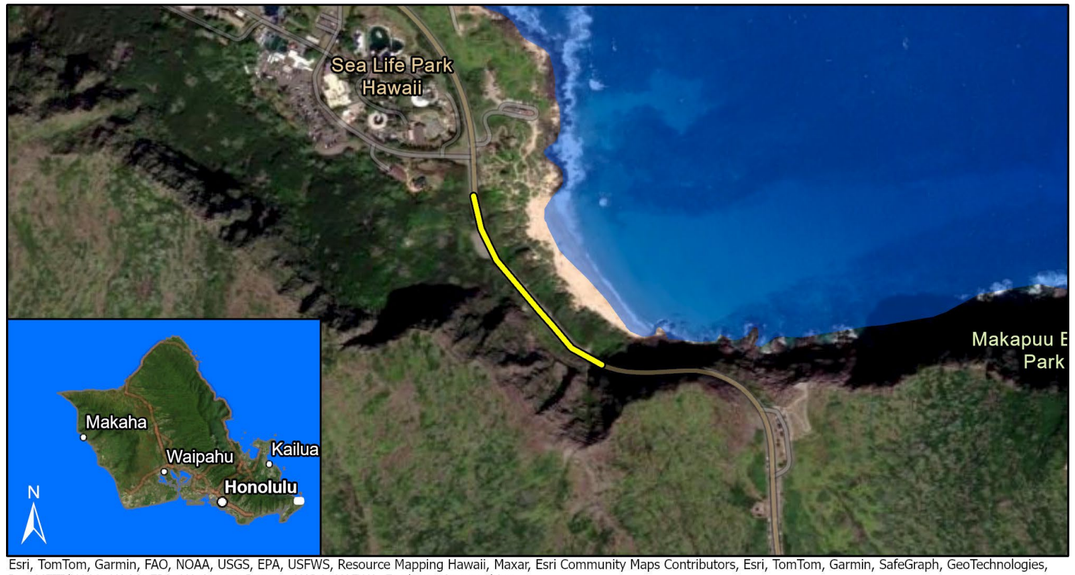
OS-25-07 Kalanianaole Highway (Route72), Rockfall Mitigation, Vicinity of MP 8.14 to MP 8.35

- **Description:** Scope is to identify and install engineering sounds, and a site appropriate rockfall mitigation measure that will be acceptable to the public and regulatory agencies

- **Funding source:** National Highway Performance Program Funds

- **Estimated total project cost:** $9.6 million



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OS-25-08 Likelike Highway (Route 63), Rockfall Protection at Wilson Tunnel, Kaneohe Side

- **Description:** Install a hybrid attenuator straddled over the culvert and slope down to the top of the portal
- **Funding source:** National Highway Performance Program Funds
- **Estimated total project cost:** $5.0 million

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OS-25-09 Moanalua Freeway (Route H-201), Rockfall Protection, Vicinity of Middle Street

- **Description:** Initiate rockfall mitigation measures along the Moanalua Freeway to prevent potential rockfall incidents

- **Funding source:** National Highway Performance Program Funds

- **Estimated total project cost:** $4.0 million

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OS-25-10 Highway Lighting Replacement at Various Locations, Oahu

- **Description:** Replace highway lighting
- **Funding source:** National Highway Performance Program Funds
- **Estimated total project cost:** $3.4 million

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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OC-25-01 Pearlridge Bus Transfer Center and Plaza

- **Description:** Plan and design a sustainable and resilient bus transfer station

- **Funding source:** Urbanized Area Formula/Growing States and High-Density States Formula Funds (§5307/5340)

- **Estimated total project cost:** $13.463 million

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OC-25-02 Bus Operations Site Improvements

- **Description:** To modify transit centers to improve the safe and efficient operation and circulation of buses

- **Funding source:** Urbanized Area Formula/Growing States and High-Density States Formula Funds (§5307/5340), and Local Funds

- **Estimated total project cost:** $1.75 million

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Please submit comments by Friday, May 17, 2024

Document Links:

TIP FFYs 2025-2028

TIP FFYs 2025-2028 Comment Form

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VI. Invitation to interested members of the public to be heard on matters not included on the agenda

OAHU METROPOLITAN PLANNING ORGANIZATION

VII. Announcements

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VIII. Adjournment