Discussion Topics

- Hanalei Bridge Repair
- Hanalei Hill and Waikoko Slope Stabilization
- Hanalei Bridge Traffic Signal
- Hanalei River Bank Erosion
- Traffic Calming at Wainiha Country Market
- Traffic Calming in Hanalei Town
- Hanalei Valley Viewpoint
- Kuhio Highway Roadway Projects
Hanalei Bridge Repair
Scope of Work

- Refurbish timber deck
- Address severe corrosion and section loss primarily for the Warren Truss and bridge stringers
- Replace damaged post-tensioned rods
- Clean and repaint to protect from corrosion
Hanalei River Bridge Repair

- Project Schedule: Begin Early 2023
- Duration: 12 months, preliminary estimate of night closures of 6 months
  - 11:00 pm to 5:30 am (Sunday night to Thursday night)
- A temporary bridge alternative was considered but was not selected due to environmental impacts and associated permitting requirements.
Hanalei Hill and Waikoko Slope Stabilization
Anchored Wire Mesh

- Photos of previous installations of the anchored wire mesh system, vicinity of Wainiha
- Installed following 2018 flood event
Hanalei Hill
Slope Stabilization

- Install soil nail anchor mesh system and drainage improvements
- Project Schedule: Begin early 2023
- Preliminary estimate of overall contract duration is 26-months for both locations (Hanalei Hill and Waikoko)
  - Hanalei Hill Day Work for 12 months
  - Hanalei Hill Night Work for 4 months
- Preliminary Proposed Lane Closure Timeframes:
  - One lane (contra flow) day closures at top of hill for drainage improvements
  - One lane night closures (11:00 pm to 5:30 am) along hillside for drainage improvements
Waikoko Slope Stabilization

- Install soil nail anchor mesh system
- Project Schedule: Begin early 2023
- Preliminary estimate of overall contract duration is 26-months for both locations (Hanalei Hill and Waikoko)
  - Waikoko Day Work 12 months
- One lane permanent closure for duration of work at Waikoko
  - Flagger present during the day and temp traffic signal during the night.
Hanalei Bridge Traffic Signal
Hanalei Bridge Traffic Signal Plans

- Install traffic signals at both ends of Hanalei Bridge
- Install rumble bars approaching Hanalei Bridge
- Install 6 traffic signal poles, 2 warning beacons for traffic signal system
- Installing Signs:
  - 13 new signs (3 chevrons), 8 existing signs being removed
  - 8 signs being replaced (3 chevrons), 2 existing to remain
- Potential removals: remove 6 chevrons, 1 advanced warning beacon, 1 falling rocks warning sign, rumble bars
Existing Morning Condition
Morning Condition with Traffic Signal
Existing Afternoon Condition
Afternoon Condition with Traffic Signal
Hanalei River
Bank Erosion
Hanalei Bank
Existing Conditions

- Stream bank scouring and erosion is being caused by flood flows and hau bush encroachment into the channel.
- Heavy rain events from March 2021 resulted in portion of existing guardrail to fall into the river.
- May 2022, emergency roadway widening was done to move the travel way away from the encroaching erosion
Existing Condition Cross Section
**Hanalei River Bank Stabilization**

- Repair and stabilize 300 feet of eroded streambank
- Project Schedule: Design and permitting completion 2023
- Various alternatives being considered
  - Ungrouted Riprap
  - Rock Marine Mattresses
  - Vegetated Earth Reinforced Wall
  - Sheet Pile Walls
Rock placed on the streambank to provide a stable embankment and protect from scour:

### Ungrouted Riprap

**Pros**
- Can move and “flex” as stream shifts
- Rock can provide aquatic habitat
- Natural aesthetics

**Cons**
- Encroachment into stream channel
- Requires temporary cofferdam and dewatering in stream for installation
Rip-rap - Cross Section

- Rip-rap:
  - 21
  - 'Rip' - 'rap' - 'Cross' Section

- Diagram:
  - Temporary Cofferdam for Dewatering
  - Edge of Brush
  - Rip-rap: 30" thickness, Class IV, toe for scour protection
  - Existing ground, subgrade:
    - Soft sandy silt and loose fine sand
  - Existing subgrade:
    - 12" to 18" thick working base
  - Rip-rap:
    - 2" minus crushed rock with little to no fines
    - Provide as needed to rebuild bank to 2:1 slope
    - Provide tensar interax NK800, ground at 12" min. intervals
  - Geotextile filter fabric under rip-rap: infrared woven or approved equal

- Scale:
  - Horizontal = 20'
  - Vertical = 1' = 10'

- Proposed Conditions Cross-section 2
Engineered rock filled mattress encapsulated by geogrid designed for marine applications to provide a stable embankment and protect from scour.

**Rock Marine Mattress**

**Pros**
- Mattress made of HDPE material to be UV resistant
- Integrated geotextile fabric helps to hold soil back as mattress “flexes” with the stream

**Cons**
- Encroachment into stream channel
- Requires temporary cofferdam and dewatering in stream for installation
Lifting Tab (typical)
Top
Bottom
Side
Stone Fill
Diaphragm
End

20 ft - 30 ft typical (filled portion) for 12 in. mattress thickness.

Compartment shown half-filled for illustrative purposes.
Vegetated Earth Reinforced Wall

Soil-filled geotextile bag wall system designed to stabilize the streambank. Combines the engineering strength of geotextiles and ground anchors with soil and plants to deliver a sustainable, vegetated solution.

**PROS**
- A vegetated, natural solution

**Cons**
- Longer installation time
- Encroachment into stream channel
- Requires temporary cofferdam and dewatering in stream for installation
Vegetated Earth Reinforced Wall
- Conceptual Typical Section

Control Surface Water by Diverting Overland Flow from Wall.

Cover Coping with Low Permeable Soil and Plant

Set Top Course Perpendicular to Wall Face.

On-Site or Imported Backfill.

Connector Pins (2 per bag)

Set First Course of Units Perpendicular to Wall Face (Foundation Course)

Install Connector Pins (2/p bag) Into the Base Course Material Prior to Installing the Foundation Course

Fit Geotextile bags Units into Rip Rap. Wrap Foundation Course with Stratagrid SG200 Geogrid or Equal

Approx. 5'-8' EXPOSED HEIGHT

Duck Bill 68 Earth Anchor or Equal. Depth to be 8'

#7 Epoxy Coated Rebar or 1.5" Steel Pipe Connector. Wrap to Bags with Stratagrid Geogrid SG200 or Equal

Foundation Soil

1/8" Stainless Steel Wire Per Manufacturer

Filter Fabric as Specified

Rip Rap or Stone Toe Protection
A vertical wall formed by interlocking members that are driven into the ground.

Sheet Pile Wall

PROS
• Little to no encroachment into stream channel
• Fast Installation
• Does not require dewatering or work in stream

CONS
• A non “natural” solution
Sheet Piles - Cross Section
Sheet Piles W/ Optional Rip-rap - Cross Section
Hybrid Approaches

1. Eliminate need for a temporary cofferdam.
2. Sheet piles provide protection from toe scour.
3. Reduces footprint of system into Hanalei River
Traffic Calming at Wainiha Country Market
Rubber Speed Humps
Traffic Calming at Wainiha Country Market

- Install speed hump to reduce speed
- Utilize rubber speed humps
- Install warning signs and pavement markers to notify drivers of the upcoming speed hump
Traffic Calming in Hanalei Town
Traffic Calming Devices in Hanalei

- Existing Speed Hump at Waioli Bridge
- Existing Raised Crosswalk at Hanalei Elementary School
- Potential Locations at Waioli Huiia Church, Malolo Rd, Aku Rd, west Ching Young Village entrance, between Aku Rd and Hanalei Dolphin Center (Speed Hump) and at the Hanalei Dolphin Center (Speed Hump)
- Raised crosswalks will install rectangular rapid flashing beacons (RRFB) for increased pedestrian safety
Current Striping Plan

- 2 North bound lanes (1 Dedicated Right Turn into Ka Haku Road) and one South bound lane
- Auxiliary lanes for turns into and out of the Hanalei Valley Viewpoint
*Stripers to return to the job the week of June 13th to complete pavement markings and striping.
Proposed Striping

- One lane in each direction
- Auxiliary lanes for turns into and out of the Hanalei Valley Viewpoint
- Eliminates the Ka Haku Road extension from Kapaka St.
- Anticipated to be completed after the completion of the Kuhio Highway Resurfacing, Kahiliholo to Ka Haku Road project
Kuhioio Highway Roadway Projects
Kuhio Highway Roadway Projects
• Realign pavement markings at the Hanalei hairpin turn, MP 0.6 (2022)
• Restripe fading pavement markings, MP 1.2 to MP 4.2 (2022)
• Proposed Resurfacing and Safety Improvements under consideration, MP 0 to MP 4.5 (2024)
  • Installation of enhanced pavement markings
  • Installation of high friction surface treatment along Hanalei Hill
  • Installation of raised crosswalks and speed humps
  • Install rectangular rapid flashing beacons at marked crosswalks
  • Extension of sidewalks along Kuhio Highway
Kuhio Highway Pavement Preservation and Restriping

- Install crack seal/slurry seal pavement preservation, MP 6.4 to MP 8 (2022)
- Restripe fading pavement markings, MP 6.4 to MP 10 (2022)
- Install drainage improvements near MP 9.5 (2023)
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Hanalei Bridge Traffic Signal
☐ Support  ☐ Oppose
Comments:

Hanalei Riverbank Stabilization Options
☐ Ungrouted Rip Rap  ☐ Rock Marine Mattress  ☐ Sheet Pile Wall
☐ Vegetated Earth Reinforced Wall  ☐ Vegetated Earth / Sheet Pile Hybrid  ☐ Rock Marine Mattress / Sheet Pile Hybrid
Comments:

Wainiha Country Market Traffic Calming
☐ Support  ☐ Oppose
Comments:

Hanalei Town Traffic Calming
☐ Waioli Huiia Church  ☐ Malolo Road  ☐ West Ching Young Village entrance
☐ Aku Road  ☐ Between Aku Road & Hanalei Dolphin  ☐ Hanalei Dolphin
Comments:
Name (optional): ___________________________________ FEEDBACK FORM

Contact Info (optional): ___________________________________

Kuhio Highway Sidewalk Extensions

From: ____________________________________________ To: ____________________________________________

From: ____________________________________________ To: ____________________________________________

From: ____________________________________________ To: ____________________________________________

From: ____________________________________________ To: ____________________________________________

Comments:

Pavement Resurfacing MP 0 (Princeville) to MP 4.5 (Waikoko Bridge)

☐ Day work  ☐ Night work

Comments:

Miscellaneous Comments

To submit:

• Complete and drop off this form at the meeting
• Complete and drop off this form at, or mail to, Hawaii DOT, 1720 Haleukana Street, Lihue, Hawaii 96766
• Complete and submit form at https://hidot.hawaii.gov/presentations/ where a video recap of the meeting will also be posted