HONOAPIʻILANI HIGHWAY IMPROVEMENTS PROJECT,
WEST MAUI: UKUMEHAME TO LAUNIUPOKO

Appendix 9 – Public Comment Period Documents

November 2025

Prepared for

Honoapiʻilani Highway Improvements

Prepared by

wsp

November 2025

Contents

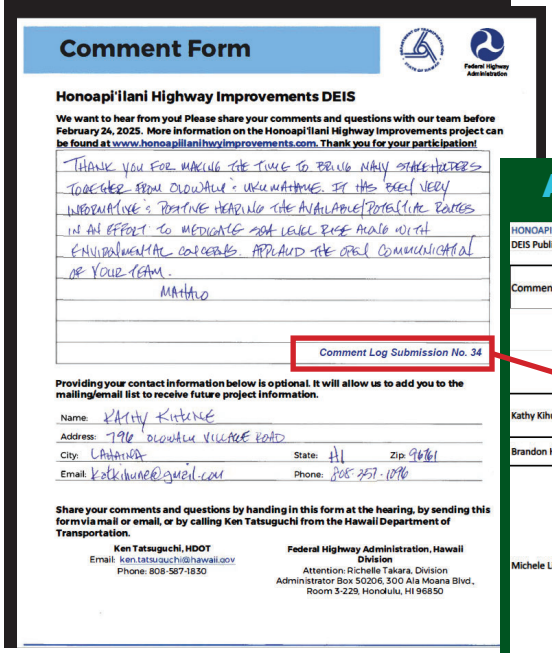
Honoapi‘ilani Highway Improvements

Reponse to Comments / Comment Log Guidance

All comments recieved during the DEIS comment period as well as comments recieved at the public hearings held for the project are included in this Comment Log. In Chapter 9, these comments are organized by topic and batched together with other similar comments. Comments in this Comment Log can be found in Chapter 9 using the number found in the “Ch. 9 Comment No.” column.

Batched comments in Chapter 9 can be found in the Comment Log using the submission number following the commenter’s name found in parethasis after each comment. The comment in Chapter 9 will not necessarily be a quote of any given comment, but rather a generalization of all similar comments recieved.

Individual Comment



Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

THANK YOU FOR MAKING THE TIME TO BRING MANY STAKEHOLDERS TOGETHER FROM OLOWALU & UKUMEHAME. IT HAS BEEN VERY INFORMATIVE & POSITIVE HEARING THE AVAILABLE/POTENTIAL ROUTES IN AN EFFORT TO MITIGATE SEA LEVEL RISE ALONG WITH ENVIRONMENTAL CONCERNS. APPLAUD THE OPEN COMMUNICATION OF YOUR TEAM.
MAHALO

Comment Log Submission No. 34

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

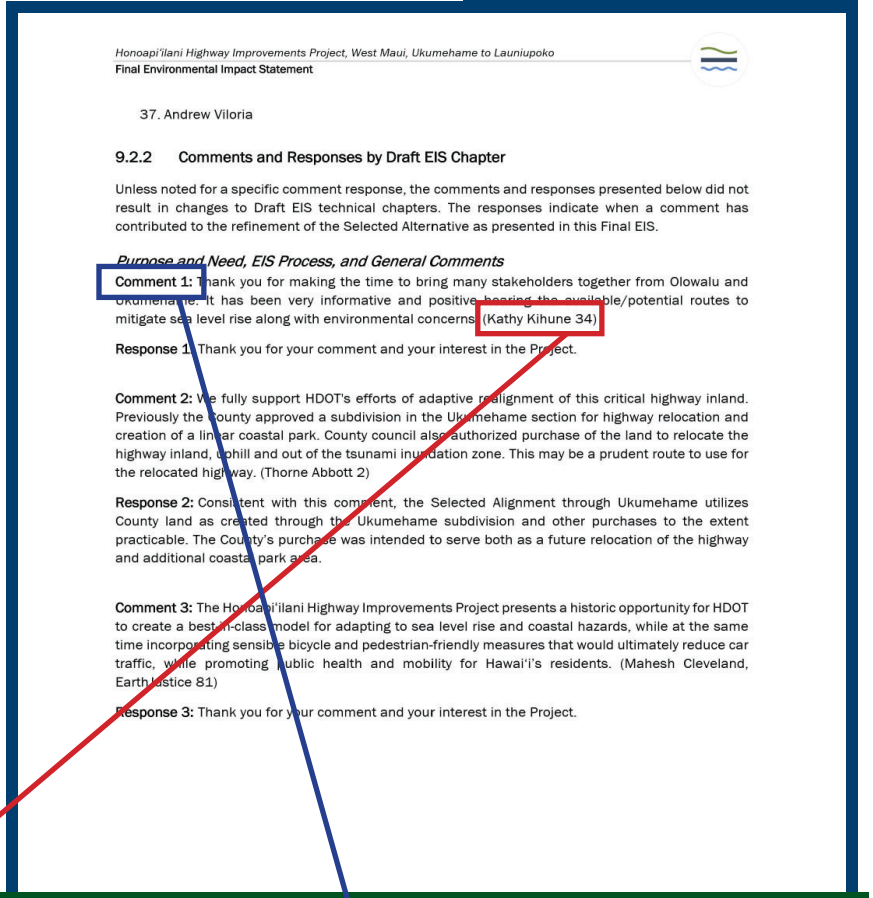
Name: KATHY KIHUNE
Address: 796 OLOWALU VILLAGE ROAD
City: LAHAINA State: HI Zip: 96761
Email: katkihune@gmail.com Phone: 808-357-1096

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

CHAPTER 9



Honoapi'ilani Highway Improvements Project, West Maui, Ukumehame to Launiupoko
Final Environmental Impact Statement

37. Andrew Viloria

9.2.2 Comments and Responses by Draft EIS Chapter

Unless noted for a specific comment response, the comments and responses presented below did not result in changes to Draft EIS technical chapters. The responses indicate when a comment has contributed to the refinement of the Selected Alternative as presented in this Final EIS.

Purpose and Need, EIS Process, and General Comments

Comment 1: Thank you for making the time to bring many stakeholders together from Olowalu and Ukumehame. It has been very informative and positive hearing the available/potential routes to mitigate sea level rise along with environmental concerns. (Kathy Kihune 34)

Response 1: Thank you for your comment and your interest in the Project.

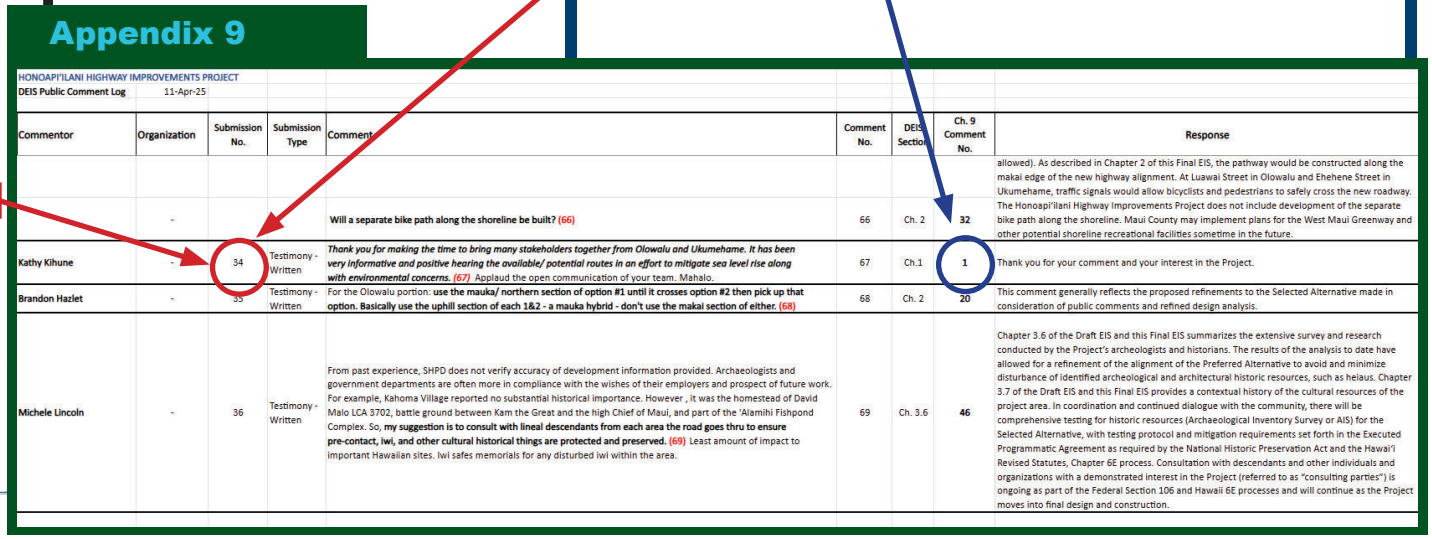
Comment 2: We fully support HDOT's efforts of adaptive realignment of this critical highway inland. Previously the County approved a subdivision in the Ukumehame section for highway relocation and creation of a linear coastal park. County council also authorized purchase of the land to relocate the highway inland, uphill and out of the tsunami inundation zone. This may be a prudent route to use for the relocated highway. (Thorne Abbott 2)

Response 2: Consistent with this comment, the Selected Alignment through Ukumehame utilizes County land as created through the Ukumehame subdivision and other purchases to the extent practicable. The County's purchase was intended to serve both as a future relocation of the highway and additional coastal park area.

Comment 3: The Honoapi'ilani Highway Improvements Project presents a historic opportunity for HDOT to create a best-in-class model for adapting to sea level rise and coastal hazards, while at the same time incorporating sensible bicycle and pedestrian-friendly measures that would ultimately reduce car traffic, while promoting public health and mobility for Hawai'i's residents. (Mahesh Cleveland, Earthjustice 81)

Response 3: Thank you for your comment and your interest in the Project.

Appendix 9



HONOAPI'ILANI HIGHWAY IMPROVEMENTS PROJECT
DEIS Public Comment Log 11-Apr-25

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
	-			Will a separate bike path along the shoreline be built? (66)	66	Ch. 2	32	allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway. The Honoapi'ilani Highway Improvements Project does not include development of the separate bike path along the shoreline. Maui County may implement plans for the West Maui Greenway and other potential shoreline recreational facilities sometime in the future.
Kathy Kihune	-	34	Testimony - Written	*Thank you for making the time to bring many stakeholders together from Olowalu and Ukumehame. It has been very informative and positive hearing the available/ potential routes in an effort to mitigate sea level rise along with environmental concerns.* (67) Applaud the open communication of your team. Mahalo.	67	Ch.1	1	Thank you for your comment and your interest in the Project.
Brandon Hazlet	-	35	Testimony - Written	For the Olowalu portion: **use the mauka/ northern section of option #1 until it crosses option #2 then pick up that option. Basically use the uphill section of each 1&2 - a mauka hybrid - don't use the makai section of either.** (68)	68	Ch. 2	20	This comment generally reflects the proposed refinements to the Selected Alternative made in consideration of public comments and refined design analysis.
Michele Lincoln	-	36	Testimony - Written	From past experience, SHPD does not verify accuracy of development information provided. Archaeologists and government departments are often more in compliance with the wishes of their employers and prospect of future work. For example, Kahoma Village reported no substantial historical importance. However , it was the homestead of David Malo LCA 3702, battle ground between Kam the Great and the high Chief of Maui, and part of the 'Alamihi Fishpond Complex. So, **my suggestion is to consult with lineal descendants from each area the road goes thru to ensure pre-contact, iwi, and other cultural historical things are protected and preserved.** (69) Least amount of impact to important Hawaiian sites. Iwi safes memorials for any disturbed iwi within the area.	69	Ch. 3.6	46	Chapter 3.6 of the Draft EIS and this Final EIS summarizes the extensive survey and research conducted by the Project's archeologists and historians. The results of the analysis to date have allowed for a refinement of the alignment of the Preferred Alternative to avoid and minimize disturbance of identified archeological and architectural historic resources, such as helaus. Chapter 3.7 of the Draft EIS and this Final EIS provides a contextual history of the cultural resources of the project area. In coordination and continued dialogue with the community, there will be comprehensive testing for historic resources (Archaeological Inventory Survey or AIS) for the Selected Alternative, with testing protocol and mitigation requirements set forth in the Executed Programmatic Agreement as required by the National Historic Preservation Act and the Hawai'i Revised Statutes, Chapter 6E process. Consultation with descendants and other individuals and organizations with a demonstrated interest in the Project (referred to as "consulting parties") is ongoing as part of the Federal Section 106 and Hawaii 6E processes and will continue as the Project moves into final design and construction.

Honoapi‘ilani Highway Improvements

Reponse to Comments / Comment Log Guidance

The comment log contained in this appendix includes all comments given during the public comment period including those provided at the public hearings.

Name & organization of Commentor

Text of each comment as provided (Original comments are included after the log table)

This column has the corresponding comment and response number where this comment can be found in the Response to Comments in Chapter 9

The response to each comment is included in this column. This response is the same response given in Chapter 9.

HONO[illegible]'ILANI HIGHWAY IMP[illegible]OVEMENTS PROJECT
DEIS P[illegible]lic Comment Log 11-Apr-25

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	-			**Will a separate bike path along the shoreline be built? (66)**	66	Ch. 2	32	The Honoapi‘ilani Highway Improvements Project does not include development of the separate bike path along the shoreline. Maui County may implement plans for the West Maui Greenway and other potential shoreline recreational facilities sometime in the future.
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Unique number Given to each Submission

Submittal Method

Bold text is used to identify substantive elements of the submission. These substantive elements are used to create the consolidated comments in Chapter 9. Bolded text is assigned an individual comment number shown in **(red)** after the bold text.

If the topic of the comment is discussed in the EIS, the section where that discussion can be found is included in the this column

DEIS Public Comments – Comment Log

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Lee Chamberlain	Maui Bicycling League	1	Email	I am writing to express strong support for the integration of the West Maui Greenway (WMG) into the Honoapiʻilani Highway realignment project. The WMG, as part of the Hele Mai Maui Legacy Projects, presents a significant opportunity to foster sustainable, multimodal transportation that strengthens resilience and community connectivity in West Maui. (1)	1	Ch. 3.5	31	
				Strategic Implementation of Segment 6. (1)The WMG Final Report (September 2022) identified Segment 6 (Olowalu to Lahaina Pali Trailhead) as a priority due to its potential to repurpose the realigned Honoapiʻilani Highway. Alternative A scored highest in the evaluation due to its scenic views, strong recreational connections, and the minimal need for new right-of-way (ROW). By utilizing the existing highway, this option is both cost-effective and highly feasible, despite its location within the sea-level rise (SLR) exposure area.	1		31	
				Compliance with the Navahine Settlement Commitments . (1)The WMG supports the Navahine Settlement's mandate to expand multimodal transportation infrastructure, including pedestrian pathways and bikeways, to reduce vehicle miles traveled (VMT) and support decarbonization goals. Public Transit, Pedestrian, and Bikeway Expansion: The WMG aligns with interim goals to integrate alternative transportation options statewide. Specific Deadlines: Planning and budgeting for multimodal infrastructure must begin by April 2025, per the Mid-Range Transportation Plan (MRTP) and the Statewide Transportation Improvement Program (STIP). Budgeting Prioritization: Projects such as the WMG that align with decarbonization and VMT reduction goals are prioritized within a five-year timeline for infrastructure completion.	1		31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapiʻilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapiʻilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapiʻilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				Integration with Complete Streets Policy (1) . The WMG is a model project for the Complete Streets policy, which requires transportation projects to prioritize safety and accessibility for all users. Policy Integration: The WMG will create safe, separated pathways for cyclists and pedestrians and improve public transit access. Complete Streets Assessment: Beginning in April 2025, all Capital Improvement Projects (CIPs), including the WMG, must undergo assessments to document compliance with Complete Streets principles. Expenditure Prioritization: The WMG's focus on multimodal connectivity positions it for priority funding under the Complete Streets framework, ensuring that resources are allocated to support this vital project.	1		31	
				Alignment with Act 131 and the Hawai'i Bike Plan (1) . The WMG aligns with Act 131's requirement for a multimodal, accessible, and sustainable transportation system and the Hawai'i Bike Plan's vision for a statewide network of protected bike paths. Act 131 emphasizes separated pathways that improve public safety, health, and quality of life.	1		31	
				Current Funding and Federal Support. The WMG has secured significant financial support, including: RAISE Grant: $15 million awarded to the WMG to support development and implementation efforts. Inclusion in STIP (MC28): Ensures that the project is recognized as a priority for state and federal transportation funding allocations. This available funding underscores the importance of expediting the WMG by integrating Segment 6 into the Honoapiʻilani Highway realignment project, ensuring that the funds are utilized effectively and within the required timelines. (2)	2	Ch. 3.5	34	As set forth in the Draft EIS and this Final EIS, the Honoapiʻilani Highway Improvements Project is fully compatible with the ultimate development of the West Maui Greenway (although, as indicated in the comment, it would be a separately funded project). With jurisdiction of the existing Honoapiʻilani Highway being transferred to Maui County as part of the Project, planning elements of the West Maui Greenway that use the existing highway's right-of-way (or adjacent areas) would be more easily integrated with County actions. Due to the funding identified above, separate approvals would be required related to the West Maui Greenway project, and the purpose and need for the West Maui Greenway project would be distinct from the purpose and need for the Honoapiʻilani Highway Improvements Project.
				Environmental and Permitting Benefits. Repurposing the existing highway corridor may qualify for a Categorical Exclusion (CE) under 23 CFR 771.111(f), as the project involves minimal environmental impact. This streamlined approach reduces the need for extensive environmental reviews and accelerates project implementation. Public Health and Emergency Preparedness. The WMG will enhance community health by promoting active transportation and equitable access to safe recreational spaces. Additionally, the greenway can function as a non-motorized evacuation route, supporting emergency response efforts in disaster scenarios.				
				Recommendation: I respectfully urge HDOT and FHWA to incorporate the West Maui Greenway into the Honoapiʻilani Highway realignment plan by repurposing the existing highway for Segment 6. This approach will maximize cost-efficiency, adhere to policy mandates, and support West Maui's resilience, safety, and community connectivity goals. (3) Thank you for your commitment to building a sustainable and resilient transportation future for West Maui.	3	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapiʻilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapiʻilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapiʻilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Thorne Abbott	Coastal Planners LLC	2	Email	We fully support. HDOT's efforts of adaptive realignment of this critical highway inland. Previously the County approved a subdivision in the Ukumehame section for highway relocation and creation of a linear coastal park. County council also authorized purchase of the land to relocate the highway inland, uphill and out of the tsunami inundation zone. This may be a prudent route to use for the relocated highway. (4)	4	Ch. 1	2	Consistent with this comment, the Selected Alignment through Ukumehame utilizes County land as created through the Ukumehame subdivision and other purchases to the extent practicable. The County's purchase was intended to serve both as a future relocation of the highway and additional coastal park area.
Carter Barto	Aloha Self Storage Lahaina	3	Email	I am writing to express my strong support for the proposed project to realign Honoapiilani Highway inland (5) and please also expand it from two lanes to four lanes. (6) As a daily commuter who relies on this highway to travel between my job in West Maui and my home in Pukalani, I have firsthand experience with the challenges posed by the current state of this vital roadway. The most recent alignment proposal makes the most sense for the long term viability of this highway.	5,6	Ch. 1	6,8	Response 6: Response 6: As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. Response 8: As stated in in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. In addition, HDOT will evaluate in the design build process the potential for including a passing lane segment as part of the initial build-out.
				Honoapiilani Highway serves as the sole viable connection between these regions, making it a critical infrastructure for residents, businesses, and visitors alike (7). However, its current alignment and capacity have proven inadequate in meeting the demands of a growing population. Increasing traffic is often caused by whale watchers, high tides washing salt water over the road, and frequent traffic jams or closures due to accidents and brush fires. The need for this project is both urgent and clear, and I urge decision-makers to prioritize its implementation for the following reasons:	7	Ch. 1	6	
				Safety (7): The existing highway's proximity to the coastline exposes it to flooding, erosion, and other hazards, particularly during extreme weather events. Relocating the highway inland will enhance safety for all users by mitigating these risks. Additionally, the expansion to four lanes will reduce congestion-related accidents by allowing for smoother traffic flow, safer overtaking opportunities, and detour options during unfortunate closures caused by fatal traffic accidents.	7	Ch. 1	6	
				Economic Vitality (7): As the primary route connecting West Maui to Central Maui, Honoapiilani Highway supports the movement of goods, services, and workforce. This need has dramatically increased following the August 2023 fires, which displaced much of the workforce to Central Maui, adding additional daily commuters who still work in West Maui. Delays and disruptions caused by traffic congestion or road closures have a significant economic impact. A four-lane highway moved inland will ensure more reliable and efficient travel, benefiting local businesses and sustaining economic growth.	7	Ch. 1	6	
				Quality of Life (7): For daily commuters like myself, the current two-lane configuration often results in extended travel times and frustration. On some occasions, I have been unable to return home or make it to work, losing an entire workday or being forced to stay overnight. The proposed re-alignment along with an expansion to four lanes will alleviate congestion, allowing residents to spend less time on the road and more time with their families or engaging in their communities.	7	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				Environmental Considerations (7): While moving the highway inland may raise concerns about environmental and cultural impacts, the current alignment's vulnerability to sea-level rise and coastal erosion poses a long-term environmental threat. A carefully planned realignment can minimize ecological and cultural disruption while safeguarding the highway's longevity.	7	Ch. 1	6	
				Emergency Preparedness (7): In times of natural disasters or emergencies, Honoapiilani Highway serves as a critical evacuation route and access point for emergency services. Expanding the highway's capacity and moving it to a safer location will ensure that it can fulfill this role effectively.	7	Ch. 1	6	
				I urge the State of Hawaii DOT and County of Maui to act swiftly to approve, fund, and complete this project. The benefits of an inland, four-lane Honoapiilani Highway far outweigh the costs, and its timely completion is essential for the safety, economic stability, and overall well-being of our community. (7) Thank you for considering my comments. I appreciate the opportunity to contribute to this important decision-making process.	7	Ch. 1	6	
Janice and James Revells	-	4	Webform	The proposed route does not show access to the Ukumehame Firing Range nor beach accesses for the general public. The four ranges are used almost daily by the numerous clubs and MPD. There is also a building used for firearm safety classes. Driving to Laniupoko and then returning toward Kahului to get to access the ranges and the beaches is ludicrous. (8) The majority of the users are local and are coming from Central. Upcountry and South Maui. Driving miles into Lahaina to just turn around to get back to the ranges and beaches is stupid. . Not having reasonable accesses to this area would encourage criminal activity and safety and health hazards. Response time for First Responders would be greatly increased. The general public needs are not being served. This realignment serves to improve drive time into Lahaina and the beauty and use of this area is Lost..	8	Ch. 3.5	37	As with all alternatives evaluated in the Draft EIS, the Preferred Alternative would retain access to the Ukumehame Firing Range and County beach parks via the existing Honoapi'ilani Highway. Trips to and from Central Maui would not have to loop as far away as Launiupoko but would use the new highway alignment's intersection with Pōhaku 'Aeko Street, which is located within a mile of the existing driveway. Placing the viaduct over the existing driveway ensures continued access and use of the firing range and also minimizes disturbance to sensitive ecological resources.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Victoria Kaluna-Palafox	-	5	Webform	My concern is to not disturb the true function of Aina. That, can never be repaired, unless we can better protect, what is. (9) Mahalo	9	Ch. 3.7	52	HDOT and the FHWA have worked to maintain an open dialogue with the community and to use this information to minimize disturbance to Aina and to cultural resources found within Ukumehame and Olowalu ahupua'a. The analyses contained within the Draft and Final EIS generally use ahupua'a as a geographic unit for delineation rather than 'ili (a smaller area of land within a ahupua'a); however, in instances where further geographic refinement was warranted (e.g., Chapter 3.7, Cultural Resources) 'ili are discussed.
Kevin Bridges	-	6	Webform	Alternative 1 would be the best alternative as it provides the shortest distance and will provide outstanding views. However, the preferred alternative would adequately address the ocean flooding issue and stand a better chance of not being delayed with nuisance lawsuits. (10)	10	Ch. 2	17	As presented in the Draft EIS and this Final EIS, the various alternatives were evaluated based on the full range of technical environmental analyses conducted as well as roadway design considerations. In addition to the loss of monkeypod trees Build Alternative 1 in Olowalu would have resulted in further potentially adverse effects related to the proximity to existing residences and the intersection of Olowalu village center and the existing highway. All the alternatives are approximately the same length, so alignment length alone was not a primary factor in the comparative impact evaluation. As described in the Draft EIS, the Preferred Alternative is based on Build Alternative 1 in Ukumehame and Build Alternative 2 in Olowalu and is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.
	-			My biggest comment is to speed up the construction timeline. The proposed construction timeline is way too long; this needs to be done now! The federal government just provided $2 billion for Lahaina housing needs so that should free up state and local money to get this project started and finished sooner. The vulnerability threat to west side is only getting worse with time and needs to be fixed sooner rather than later. Get this extremely critical project finished sooner. (11)	11	Ch. 1	9	The Project remains a high priority for HDOT and the approvals and construction implementation schedule are intended to expedite project delivery. The Final EIS/ROD must be completed in summer 2025 as a condition of project funding. HDOT will then move into the final design and construction phases of the Project and will use a design-build approach, where one contractor designs and builds the project, reducing schedule and getting this important project built faster. Construction is expected to start in 2027 and could potentially be complete and operational by 2030.
Carter Barto		7	Webform	I express strong support for the proposed project to realign Honoapiilani Highway inland and please also expand it from two lanes to four lanes. (12) As a daily commuter who relies on this highway to travel between West Maui and Central Maui, I have firsthand experience with the challenges posed by the current state of this vital roadway. Honoapiilani Highway serves as the sole viable connection between these regions, making it a critical infrastructure for residents, businesses, and visitors alike. However, its current alignment and capacity have proven inadequate in meeting the demands of a growing population and increasing traffic. The need for this project is both urgent and clear, and I urge decision-makers to prioritize its implementation. (12)	12	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
Darrell Tanaka	-	8	Webform	The homeless situation is getting worse in Olowalu, they are slowly taking over the beach area at Mile Marker 14....when the new highway is built that area will become a derelict destination....we should make it into a state park and manage it to prevent it from being trashed, its a popular tourist and local spot to take kids to the beach and snorkel and fish...in fact, make the area from Ukumehame park all the way to Olowalu general store a state beach park. (13)	13	Ch. 3.5	42	As stated in the Draft EIS and this Final EIS, encampments in the project area are an issue independent of the Honoapi'ilani Highway Improvements Project. HDOT is coordinating with other State and County officials in the ongoing management of encampments. Also discussed in the Draft EIS Chapter 5 presentation of the Preferred Alternative: when the new highway alignment connects with the existing Lāhainā bypass, the old/existing highway would be reconnected with the old highway segment that currently dead ends before the bypass. The isolated nature of the current configuration that contributed to this area's density of homeless encampments would be improved with the Project. Parkland designations are beyond the scope of the Project. However, it is noted that the shoreline is largely accessible along the length of the existing highway (as well as from the Olowalu Beach and the Olowalu Sugar Mill historic site public access and parking) and includes two County parks. This would primarily be in the realm of Maui County because the Project includes transferring the jurisdiction of the existing highway to the County. Further, the final design and potential implementation of the West Maui Greenway, in combination with County-owned recreational lands in Ukumehame, would also be under County jurisdiction.
Benny Martin	-	9	Webform	My family and I, like so many others, were deeply affected by the devastating wildfires in Lahaina. We lost our home and everything we had worked so hard for. In the aftermath, we saved what we could and decided to purchase an agricultural lot in the Ukumehame subdivision, where many other displaced families have also found a place to rebuild. It has been a journey of resilience, and the Ukumehame subdivision offers us a chance to start anew. However, I am deeply concerned about the proposed highway realignment options, especially Alternative 4, which would run directly through many of our homes in the subdivision. (14) This would have a significant and disruptive impact on the families who are already struggling to rebuild their lives. While I truly appreciate the environmental decision to move the highway away from the coastline, I strongly encourage consideration of Alternatives 2 and 3 for our section of the realignment, as they seem to pose less of a threat to the homes and families already established in the area. (14) I would greatly appreciate any information on when and where in-person testimonials or meetings will take place to discuss these important decisions. This is a critical issue for the families in Ukumehame, and we need to have our voices heard as we work toward rebuilding both our homes and our community. Thank you for considering our concerns.	14	Ch. 2	19	In both Ukumehame and Olowalu, Build Alternative 4 was intended to represent the most mauka of alignments (that is, the most separation from the coast and inundation flood zones). The evaluation of this alignment showed that the distance from the coastline resulted in substantially more potential adverse effects on private property and other environmental considerations compared with Build Alternatives 1 and 2. As identified in Chapter 5 of the Draft EIS, the Preferred Alternative was selected based on Build Alternative 1 in Ukumehame and Build Alternative 2 in Olowalu. Build Alternative 4 was not identified as part of the Preferred Alternative, and the Preferred Alternative would not result in potential adverse effects to the referenced heiau. The Preferred Alternative avoids and minimizes effects on existing residences as well as cultural resources and other environmental considerations. The alignment does not create new development opportunities within the project area.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Robert Santos	-	10	Webform	Can I see the details of the work to be done including their staging area? (15)	15	Ch. 2	25	As set forth in the Draft EIS, the proposed alignments are anticipated to largely use delineated right-of-way for staging areas during construction. Further, the key phases and construction activities are summarized in this Final EIS, including the environmental commitments to minimize and avoid potential construction-related impacts. The design-build contractor would make final decisions about specific staging areas, and their decisions would incorporate the environmental commitments identified in the combined Final EIS and ROD.
Tara King	-	11	Webform	I really hope you are going to rebuild Weinberg Court .Between PrisonSt.and Dickenson St. (16). That was the Giant (for Maui) apartment building.I think the address was 161 Honoapiilani Hwy.Naturally offer the original tenants that are still here 1st dibs.I was there since June '08, 15 years.I loved living there.I cared about my neighbors.Irwin Miyamoto was the manager.We had a good relationship with him and his family.My son left a week after the fire,he was so devastated,But I'm still here.I would love to be back in Lahaina,but I couldn't find another apartment.63 apts.altogether.We wait and hope.I still have severe PTSD.I hope you understand.Mahalo,Tara	16	Ch. 2	26	While redeveloping Lāhainā after the devastating wildfire is critically important, it is beyond the scope of this transportation project. Weinberg Court is substantially outside the study area for the Project's Draft and Final EIS.
C-T Folding	-	12	Webform	Can there be a separate biking, walking, golf cart lane, with it's own divider along the side? So many bikers are on Honoapi'ilani Hwy they deserve their own "green lane". (17) Thanks	17	Ch. 2	23	The preliminary design consideration did not include a separate pathway for non-motorized users, and all alternatives would incorporate a standard width shared-use shoulder lane that would accommodate bicyclists. This was intended to provide a direct route to and from the Pali and Lāhainā (including the viaducts and bridges) as a complement and interconnect with the primary bike route served by implementing the West Maui Greenway, which is proposed to be alongside the existing highway. Plans for the West Maui Greenway indicate the greenway is intended to provide a more substantial and integrated shared-use pathway that would be closer to the coastline and away from the main highway. However, based on these and other comments generated during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic (golf carts would not be allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway.
Kai Kalani	-	13	Webform	The next question is when do we get an escape route, not just a road down from Ulupalakua lookup down exactly 2.2 miles to the road at Makena golf course? (18) Thompson road, aka "Oprah's road" might be a handshake deal for MFD, but what about the rest of us trying to get down the hill for another fire event? (18 cont.)	18	Ch. 2	28	This comment pertains to roadways that are substantially beyond the study area of the Honoapi'ilani Highway Improvements Project and are therefore beyond the scope of the Project's Draft and Final EIS.
Darrell Tanaka	-	14	Webform	when you build the new highway, please ensure there is ample beach access routes periodically along the shoreline...DOT has recently cut off several of our traditional beach accesses from the McGregor's point to Olowalu and we don't appreciate losing our ability to fish and gather. (19) thank you.	19	Ch. 3.5	43	The new alignment of the Honoapi'ilani Highway would be mauka of the existing highway and would not provide direct access to beach areas. The roadway is proposed to be limited access only at intersections, with existing mauka to makai cross-streets. There would be no parking or pull-off areas along the new alignment. Beach access would continue to be available from the existing Honoapi'ilani Highway, which would become a County roadway and is expected to be integrated with the future plans for the Maui County West Maui Greenway. Once under County jurisdiction, the management of parking, access to adjacent beaches, and access to/from the greenway can be integrated into corridor planning.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Raymond Ishii	Valley Isle Sports Shooters Club	15	Webform	Aloha I am Raymond Ishii the current President of the Valley Isle Sports Shooters Club, which is the oldest and largest user of the Ukumehame Firing range. While I fully support moving the existing highway inland there are a number of concerns I have. The routes appear to run makai of the firing lines which we are grateful although a couple are uncomfortable close to the range. (20) The Ukumehame Firing Range is the only legal firing range on the island and is used by thousands of sportsmen's practicing marksmanship and exercising their 2nd Amendment rights. It is also used by Law Enforcement and the military on a regular basis for Firearms and riot control training, Whenever unexploded ordnance is found on Maui, they take it to the range to blow it up. I have been on the range when EOD had blown up everything from IEDs, hand grenades, live artillery shell to 100 pounds of TNT. The preferred alternative route for the bypass is an elevated viaduct that will run makai of the firing ranges, with access to the range and the beach parks will be via the Ukumehame subdivision and back tracking on the existing highway. That section of highway between Ukumehame Beach Park and Papalaua State Wayside park often has waves breaking over the wall and with sea water covering the road. This is the section that is in most the danger to eventually fall into the ocean. Is the state planning to maintain that section of the highway to it existing standards for eternity or will it abandon that section of highway once the ocean claims it, and we will lose access to the range and beach park.	20	Ch. 3.5	36	The Draft EIS and this Final EIS established and evaluated alternatives specifically with the understanding of the importance of the Ukumehame Firing Range to the community. As a public recreational resource, the firing range was further evaluated under the FHWA's obligation pursuant to Section 4(f) of the USDOT Transportation Act. Preservation of the use of the facility contributed to the identification of the Preferred Alternative such that the crossing of the new highway alignment was more makai than the original Build Alternatives 1 and 4 evaluated in the Draft EIS. By placing the alignment on a viaduct over the HDOT detention basin, the elevation of the viaduct will provide for a minimum of 20 feet of clearance for the existing firing range driveway, allowing for enough clearance for most emergency vehicles and trucks that may need to enter the facility.
				To avoid the above, would it be possible to install a turn lane before the viaduct begins on the Pali side to allow direct access to the range and beach parks, plus a merge lane on to the highway for Maalaea bound traffic. (21) That section of highway is protected from the ocean by the Papalaua State Wayside Park. This will give direct access to the public to these areas and allow Emergency Vehicle responding to the area more direct access and quicker response time. It will also allow the state to simply block off the section of the road between Papalaua Park and Ukumehame park once the road is damaged by the ocean.	21	Ch. 3.5	39	The option of having an intersection at the Pali terminus of the Project to maintain access to the old highway was reviewed and evaluated by the conceptual design team. However, the option was determined infeasible due to the angle of departure of the new highway both horizontally and vertically—the new highway must rapidly ascend an existing berm for the detention pond that is makai of the firing range—and the limited space that results from these geometric constraints. In short, the limited geometry leads to the inability to provide a safe intersection in this area.
				Another concern is the height of the viaduct, one or more of the routes has the entrance road the to range being under the viaduct. Will the viaduct be high enough to allow fire trucks and heavy equipment to drive under it. Due to the constant threat of brush fires on the Pali, and medical calls to the range, the more access Emergency Services has the better. (20)	20	Ch. 3.5	36	The Draft EIS and this Final EIS established and evaluated alternatives specifically with the understanding of the importance of the Ukumehame Firing Range to the community. As a public recreational resource, the firing range was further evaluated under the FHWA's obligation pursuant to Section 4(f) of the USDOT Transportation Act. Preservation of the use of the facility contributed to the identification of the Preferred Alternative such that the crossing of the new highway alignment was more makai than the original Build Alternatives 1 and 4 evaluated in the Draft EIS. By placing the alignment on a viaduct over the HDOT detention basin, the elevation of the viaduct will provide for a minimum of 20 feet of clearance for the existing firing range driveway, allowing for enough clearance for most emergency vehicles and trucks that may need to enter the facility.
				Lastly during construction, will we be allowed access to the range. Understandably while the viaduct is being constructed, the section under it will be blocked off. Will a temporary road be constructed to allow access under a completed section of the viaduct to ensure access to the public firing range. (22) Thank You for allowing me to comment on this matter. Raymond Ishii President, Valley Isle Sports Shooter Club	22	Ch. 3.5	40	Because the viaduct would be constructed with piers on either side of the firing range driveway, the construction-related disruption to the driveway itself would be short-term. While the viaduct structures are being placed across the driveway from pier to pier, the driveway could be temporarily closed. The design build contractor would be required to coordinate construction phasing and sequencing in this area with Maui County Parks and Recreation (the owner and operator of the firing range).
Robert Cole	-	16	Webform	Please do everything possible to make this happen. This is so very important for the island, the community, and the planet. (23) Mahalo, Robert.	23	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Dan Dennison	-	17	Email	Testimony in Support of the Realignment of Honoapi‘ilani Highway with Emphasis on West Maui Greenway Connectivity. Aloha members of the committee, I am writing to express my support for the proposed 6.5-mile mauka relocation of the Honoapi**‘ilani Highway. This critical realignment will safeguard a vital transportation corridor that serves as a lifeline for** West Maui residents, workers, and visitors, addressing the escalating risks posed by rising sea levels and climate change. (24)	24	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				As we work toward a more resilient future, this project is a pivotal step in West Maui’s recovery, resilience, and sustainability. However, while I support the realignment project, it is essential to highlight a complementary opportunity to strengthen active transportation options and preserve the vision of the West Maui Greenway (WMG). I respectfully urge the Hawai**‘i Department of Transportation (HDOT) to prioritize the following key elements within this project: 1. Utilization** of the Old Highway 30 for West Maui Greenway Segments 6 and 7. (25) The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path. Repurposing this scenic corridor as a multi-use trail is a cost-effective solution that supports safe, non-motorized transportation and recreation. This approach would facilitate the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities. 2. Alignment with Climate and Community Goals. Incorporating the WMG within the realignment project would align with Maui’s commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement. A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness. 3. Community-Driven Design for Long-Term Benefits. By transforming the former highway into a recreational and commuting pathway, we can create a lasting community asset that bolsters economic recovery, public health, and local tourism. A dedicated bike and pedestrian trail would provide safe, scenic access to key cultural and natural landmarks, fostering community pride and environmental stewardship.	25	Ch 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				In summary, while I support the current realignment effort, I respectfully request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. By repurposing this space for non-motorized transportation, we can build a legacy of sustainable infrastructure that meets the needs of future generations and supports West Maui’s long-term recovery and growth. (25 Cont.) Sincerely, Dan Dennison Honolulu.	25	Ch. 3.5	31	
Donna Clayton	West Maui Greenway Alliance	18	Email	Testimony in Support of the Realignment of Honoapi‘ilani Highway with Emphasis on West Maui Greenway Connectivity. Aloha members of the committee, I am writing to express my support for the proposed 6.5-mile mauka relocation of the Honoapi**‘ilani Highway. This critical realignment will safeguard a vital transportation corridor that serves as a lifeline for** West Maui residents, workers, and visitors, addressing the escalating risks posed by rising sea levels and climate change. (26)	26	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				As we work toward a more resilient future, this project is a pivotal step in West Maui’s recovery, resilience, and sustainability. However, while I support the realignment project, it is essential to highlight a complementary opportunity to strengthen active transportation options and preserve the vision of the West Maui Greenway (WMG). I respectfully urge the Hawai**‘i Department of Transportation (HDOT) to prioritize the following key elements within this project: 1. Utilization** of the Old Highway 30 for West Maui Greenway Segments 6 and 7. (27) The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path. Repurposing this scenic corridor as a multi-use trail is a cost-effective solution that supports safe, non-motorized transportation and recreation. This approach would facilitate the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities. 2. Alignment with Climate and Community Goals. Incorporating the WMG within the realignment project would align with Maui’s commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement. A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness. 3. Community-Driven Design for Long-Term Benefits. By transforming the former highway into a recreational and commuting pathway, we can create a lasting community asset that bolsters economic recovery, public health, and local tourism. A dedicated bike and pedestrian trail would provide safe, scenic access to key cultural and natural landmarks, fostering community pride and environmental stewardship.	27	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				In summary, while I support the current realignment effort, I respectfully request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. By repurposing this space for non-motorized transportation, we can build a legacy of sustainable infrastructure that meets the needs of future generations and supports West Maui’s long-term recovery and growth. (27 Cont.) Thank you for the opportunity to provide testimony. I encourage my fellow community members to participate in this process and advocate for an active transportation network that prioritizes safety, sustainability, and connectivity. Mahalo nui loa for your consideration. Donna Clayton/West Maui Greenway Alliance	27	Ch. 3.5	31	

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Constantine Mittendorf	-	19	Webform	Testimony in SUPPORT of Honoapi‘ilani Highway Realignment – Connect the West Maui Greenway Aloha committee members, I am writing to support realigning the Honoapi’ilani Hwy and expanding the West Maui Greenway. Specifically, I support the proposed 6.5-mile mauka relocation for starters. This realignment is critical and will safeguard a vital transportation corridor. Realignment will mitigate against risks posed by rising sea levels, wildfire, and climate change. This project is a pivotal step in West Maui’s recovery, resilience, and sustainability. (28)	28	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				I urge the Hawai**‘i Department of Transportation (HDOT) to prioritize the following: Use the Old Highway 30 for West Maui** Greenway. (29) The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path. Further, it would help diversify transportation and options in case of emergency. It would be absolutely fantastic for our keiki and future. Folding the former highway into the West Maui Greenway will create a major community asset that bolsters economic recovery, public health, and local quality of life. Please incorporate the WMG within the realignment project. (29 Cont.) It would align with Maui’s commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement. Including the West Maui Greenway into this project will likely also help the Maui County and the State of Hawaii in reaching it’s legal obligations regarding climate change and public safety. Mahalo nui loa for your consideration. Constantine Mittendorf January 23, 2025	29	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
Jerome Kellner	-	20	Email	Aloha members of the committee, I support the proposed 6.5-mile mauka relocation of the Honoapi‘ilani Highway. (30)	30	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				I urge the Hawai**‘i Department of Transportation to prioritize key elements: Utilization of the Old Highway 30 for West** Maui Greenway Segments 6 and 7. (31) The coastal highway is an ideal route for a dedicated bike and pedestrian path. Repurposing this corridor as a multi-use trail supports safe, non-motorized transportation and recreation.This approach facilitates the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities. A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness. I support the current realignment effort, and request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. (31 Cont.) Jerome Kellner	31	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
Richard Gailey	-	21	Webform	To all concerned, The Island is a cultural Entity, moving the Honoapi’iani Highway is within everyone’s responsibility to protect this sacred place. (32) Mahalo.	32	Ch. 3.7	52	HDOT and the FHWA have worked to maintain an open dialogue with the community and to use this information to minimize disturbance to Aina and to cultural resources found within Ukumehame and Olowalu ahupua‘a. The analyses contained within the Draft and Final EIS generally use ahupua‘a as a geographic unit for delineation rather than ‘ili (a smaller area of land within a ahupua‘a); however, in instances where further geographic refinement was warranted (e.g., Chapter 3.7, Cultural Resources) ‘ili are discussed.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Van Fischer	Olowalu Ranch LLC	22	Email	Aloha, My name is Van Fischer and I am writing to you as the owner of lot 19, CPR Unit C in the Olowalu Mauka subdivision. Our property is located just mauka of the existing highway intersection with Luawai Street and wraps around to the back of the existing homes on Olowalu Village Road. We recently purchased this land and are in the planning stages of implementing a farming operation. The proposed highway location just cuts a small corner of our property and we are relieved that it will not destroy our vision for our farm. (33) That said, we believe there are a number of reasons why a minor adjustment to a small section of the highway moving the route approximately 150-200 feet mauka will improve the safety and **fl**ow of traffic and help to avoid valuable natural resources. (34)	33, 34	Ch. 5	110, 111	Response 110: Thank you for your comment and your interest in the Project. Response 111: These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable, most notably with a mauka shift of the roadway. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS.
				As you are aware, most of the subdivision lots in this area have been condominiumized. I have attached a map as exhibit A for your reference. INTERSECTION ALIGNMENT & SAFETY: Once the highway is relocated, its intersection with Luawai Street will become the main intersection for access into Olowalu. Due to sea level rise, the existing highway will need to be closed off both north and south of Olowalu so all traffic will come down Luawai Street. Lower Olowalu will become an even more popular designation once the beaches are more secluded and user friendly. As the preferred Highway route is currently designed, it does not cross Luawai Street at a right angle creating an unsafe intersection for vehicles entering the highway from both the subdivision above the new highway and out of the lower Olowalu village (34 Cont.).	34	Ch. 5	111	These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable, most notably with a mauka shift of the roadway. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS.
				This intersection absolutely must be signalized with right turn lanes. (35) For vehicles driving up Luawai Street to the highway, there is a bend in the road that will prevent drivers from seeing the traffic that is stopped at the light causing a dangerous situation with lack of safe stopping distance. (See exhibit B). If the highway is relocated 150-200 feet mauka in this small section as proposed on exhibit B, the highway will cross Luawai Street at a right angle providing maximum sight distance for vehicles using the intersection and more stopping distance for vehicles approaching the intersection from the lower road. (34 Cont.) It also makes more sense to locate the detention basin next to this intersection as it can be used to collect the water that **fl**ows down Luawai Street in heavy rain events. (34 Cont)	35	Ch. 5	113, 111	Response 113: As indicated in the Draft and Final EIS, this intersection is proposed to be fully signalized. Response 111: These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable, most notably with a mauka shift of the roadway. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS.
				TOPOGRAPHY: The topography along a section of the mauka lot line of lot 19 CPR Unit C has a very steep 10-12 foot tall cut bank that runs along that property line in the exact area where the proposed highway crosses that property corner. Due to the continued rise up the hill, building the highway in this spot will result in the sloped bank of the highway will be approximately 20 feet high or more. Simply moving the highway mauka 100 feet or so will eliminate this situation. (36) In the area we are proposing the highway be moved to, the cross section topography is reasonable and will not add cost to the construction of the highway. (See exhibit C).	36	Ch. 5	114	These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable, most notably based on the mauka shift of the roadway as noted by the comments. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS.
				PROTECTION OF NATURAL RESOURCES: Mopua Stream is shown on the Olowalu maps as running straight down mauka to makai crossing through lot 19. It is an open stream from the mauka property line to the existing highway where a culvert crosses the highway into the ocean but is an underground stream above our property. The open section of this stream is teaming with life and well worth protecting. (37) In our exploration of the property, it appears there is also an underground stream channel that runs along the mauka property line of lots 19 and 20. (38) At a point on the Lot 20 mauka property line there is an existing abandoned pump house and moving water is visible in the bottom of the trench. It appears water comes together from multiple directions to this point and then flows underground along our mauka property line into the open section of Mopua Stream. Moving the highway mauka as we propose will protect this valuable water source as we do not know if it is coming from springs or other underground streams. (38 Cont.) Provisions should also be made for a culvert to be placed under the highway should State wish to re-establish all of Mopua Stream as an open channel in the future. (39) (See exhibit C)	37, 38, 39	Ch. 5	115	These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS. During final design further geotechnical studies would be conducted related to the limits of disturbance. These studies would identify subsurface conditions (including potential underground streams) and potential design modifications would be evaluated based on those findings.
				FARM SOIL PROTECTION: The other consideration in locating the highway should be the protection of quality farming soil. The property above our mauka property line is very rocky and not suitable for farming. It is at best pasture land. All of lot 19 and 20 are comprised of good quality soil and it would be a shame to use any more of that land for the highway than absolutely necessary. (40) The viability of this soil to produce food plants and trees is clearly evidenced by the extensive crops being grown on the two farms by the regenerative farm stand and the two farms and orchards makai of the highway. Moving the highway mauka just the proposed distance protects an additional six or more acres of this soil.	40	Ch. 5	116	The consideration of soils of concern to the property owner are accommodated in the overall request of a mauka shift that has been included in the refinements to the Selected Alternative. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS.
				HOUSING: The route as proposed cuts directly through Lot 19 CPR Unit A and Lot 20 CPR Units A and B and includes a proposed detention basin in that area. As such, the State will need to acquire most if not all of each of these parcel rendering the remainder unbuildable as home sites. (41) These parcels are well suited to local style housing and should be saved if possible. (See exhibit A). The land just mauka of these parcels consists of an agricultural parcel that is designated as part of the subdivision Greenway Open Space. If the State agrees to move the highway as proposed, the owners of Lot 20 Units A and B would be willing to donate an open space easement on one acre of the Lot 20 CPR Units A and B to offset a portion of the loss of the required greenway at no cost to the State. (41 Cont.) (See exhibit C).	41	Ch. 5	117	These comments have been reviewed and incorporated into the refinements of the Selected Alternative.
				Moving the highway as suggested will add needed safety features, protect natural resources and reduce the cost of the project. We respeceully request that the State take a through look at all of the benefits this small adjustment will accomplish. Sincerely, Van Fischer				

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Anna Nalaniewalu Vinuya-Palakiko	-	23	Email	My name is Anna Nalaniewalu Vinuya-Palakiko. I am the 3rd great grand daughter of James Palakiko and Julia Piko of Olowalu and 3rd great cousin of Lily, James Jr and Maui Palakiko. All 5 are buried on top of Pu'u Kilea in unmarked burials. *My family kuleana aina is in Olowalu Valley and Ukumehame Valley (42)* . Our ohana of this area are; Palakiko,Piko, Pu'upa'a,Ka'awili,Pupuhi, Kaumaka, Kaho'opi'i, and Cason/Napaepae. *It has been brought to my attention that our aina and iwi in Olowalu are in harms way. I have attempted multiple times to have my ohana burials marked and chained off to help prevent future vandalism because it has happened in past (42).* example: petroglyphs with non prehistoric markings, names carved in the rocks and ceremonial items taken from the burials. My request is for them to be on the burial protection list and marked so visitors will know that it's protected Native Hawaiian burial site. (42) I also have death certificates proving my family is buried here if needed.	42	Ch. 3.6	45	We understand the community's concerns with burials in the project area and have been in communication with descendants and the Maui Lanai Island Burial Council. As stated in the Executed Programmatic Agreement (Appendix 3.6 of this Final EIS), the Maui/Lāna'i Island Burial Council (MLIBC) has the authority to determine treatment and jurisdiction over all requests to preserve or relocate previously identified Native Hawaiian burial sites. If a previously identified Native Hawaiian burial site will be affected by the project, HDOT, through its contractor, shall follow HAR § 13-300-33, Request for council determination to preserve or relocate Native Hawaiian Burial sites. With regard to burials in proximity to Pu'u Kilea, the Preferred Alternative would be makai of Pu'u Kilea and the Project would not result in physical disturbances to that area.
	-			The proposed APE (orange line) I say A'ole completely to this option because this would expose my family burials and bring more harm and vandalism with the road directly in front of it... there would be little to no protection for them... The proposed Alternate route #1 (red line) I say A'ole completely to this option because my grandmother foundation can still be found within the bushes, near the old water tower fronting Naho'oikaika aina just behind the Olowalu General store. I come to this area to mourn and to honor my deceased kupuna, coming here brings me comfort and helps me to stay grounded. I say NO to APE and Alternate #1 because they both would disrupt the land of which my family lived and is buried upon and lacks of respect to our people Kanaka Maoli because it offers no protection for our iwi and some of the only untouched aina left here in west maui. (43)	43	Ch. 3.6,	47	For clarification, the APE line referenced in the comment is intended to show the extent of the Project's study area of possible project effects on historic architectural and archaeological properties (the APE is not a proposed roadway alignment). In the evaluation of all Draft EIS alternatives for Olowalu, Build Alternative 4 (which is closest to the APE boundary) and Build Alternative 1 were excluded from the Preferred Alternative because these alternatives would have the greatest potential for adverse effects on historic properties (though neither directly affect the Naho'oikaika property).
	-			With this plan there is no acknowledgment of the ancient burials, heiau, reef, trees, water ways and uses, taro fields, and animals example: the endangered species ; Nene bird. (44) In order for me to ever be in agreement. There would have to be many steps taken to ensure all of which I addressed are acknowledged and cared for to the upmost respect as if it was your own families burials and kuleana. Protections in place for areas that have already been acknowledged to have ancient burials and Ka'iwaloa heiau. Research and surveyance of the land and water in and around Olowalu before construction using archaeologist, historians, and burial council. (45) Reviewing land patents, LCA land commission awards, survey records, and acknowledging water and land right given to our people from our Ali'i. (46) Allow for the people of the aina to determine the clarity of the research and surveyance. Starting with taking care of the people of the land and what is truly important our family history the only thing left for us to hold on too..	44, 45, 46	Ch. 3.6,	46, 72	Response 46: Chapter 3.6 of the Draft EIS and this Final EIS summarizes the extensive survey and research conducted by the Project's archeologists and historians. The results of the analysis to date have allowed for a refinement of the alignment of the Preferred Alternative to avoid and minimize disturbance of identified archeological and architectural historic resources, such as heiaus. Chapter 3.7 of the Draft EIS and this Final EIS provides a contextual history of the cultural resources of the project area including the importance of land, water, animals. Chapter 3.10 also looks at the areas flora and fauna including endangered species. In coordination and continued dialogue with the community, there will be comprehensive testing for historic resources (Archaeological Inventory Survey or AIS) for the Selected Alternative, with testing protocol and mitigation requirements set forth in the Executed Programmatic Agreement as required by the National Historic Preservation Act and the Hawai'i Revised Statutes, Chapter 6E process. Consultation with descendants and other individuals and organizations with a demonstrated interest in the Project (referred to as "consulting parties") is ongoing as part of the Federal Section 106 and Hawaii 6E processes and will continue as the Project moves into final design and construction. Response 72: The Final EIS incorporates a range of environmental commitments (see Chapter 5) that would be required to protect the nēnē during construction. These include but are not limited to high visibility signs to alert drivers to their presence, training for all on-site staff to recognize and protect nēnē, and protocol on what to do if nēnē or their nests are observed.
	-			In conclusion, the only option that I would be in agreement with is Alternate #2, * It is far enough away from both my family burials, kuleana land and foundation to provide more distance in hopes to give more protection from unwanted vandalism or desecration. * It is far enough away to offer protection of archeological sites ae, Petroglyphs, Ka'iwaloa, Lanakila Church, and Japanese burials. I say NO (A'ole) to APE and Alternate #1. (47) I look forward to our future conversations to talk about my ohana and Olowalu. Thank you for your time and understanding of my concerns, Sincerely, Anna Nalaniewalu Vinuya-Palakiko	47	Ch. 5	49	This is the Selected Alternative through Olowalu as described by the comment.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Saman Dias	Maui Bicycling League	24	Email	A Message from the Maui Bicycling League Chair: Help Shape West Maui's Future. Aloha Members of the Committee, My name is Saman Dias, and I am the Chair of the Maui Bicycling League. I am submitting this testimony to express my strong support for the proposed 6.5-mile mauka relocation of the Honoapi**'ilani Highway. This project is critical for safeguarding** this vital transportation corridor from the impacts of rising sea levels and climate change, ensuring the safety and connectivity of West Maui's communities. (48)	48	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				While I wholeheartedly support the realignment, I urge the Hawai**'i Department of Transportation (HDOT) to seize this** opportunity to enhance active transportation options by incorporating the West Maui Greenway (WMG) into the project. Specifically, I encourage prioritizing the following elements: Utilization of Old Highway 30 for West Maui Greenway Segments 6 and 7: (49) The existing coastal highway offers an unparalleled opportunity to create a safe, scenic bike and pedestrian path. Repurposing this corridor as a dedicated multi-use trail is a cost-effective and sustainable solution to advance Segments 6 and 7 of the WMG Master Plan, fostering a connected network of paths for the benefit of residents and visitors alike. Alignment with Climate and Community Goals: Incorporating the WMG into the highway realignment aligns with the Nā Wahine Climate Settlement Agreement and Maui's broader climate resilience goals. A multi-modal transportation corridor featuring pedestrian- and bike-friendly infrastructure reduces emissions, supports healthy lifestyles, and enhances disaster preparedness. Creating a Community-Driven Asset for Long-Term Benefits: Transforming the former highway into a recreational and commuting pathway will provide a lasting asset for the community, fostering economic recovery, public health, and local tourism. A dedicated bike and pedestrian trail will also preserve access to West Maui's cultural and natural landmarks, reinforcing our shared commitment to sustainability and stewardship. This project is not only about improving infrastructure but also about building a resilient, sustainable future for West Maui. By integrating the West Maui Greenway into the realignment project, we can create a legacy that prioritizes safety, connectivity, and environmental responsibility for generations to come. Mahalo nui loa for considering my testimony. I encourage my fellow advocates and community members to join me in supporting this critical project and ensuring that the West Maui Greenway vision becomes a reality. Respectfully submitted, Saman Dias Chair, Maui Bicycling League	49	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi'ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi'ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi'ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Jason Potts	-	25	Email & Webform	I'm writing in regards to the proposed hwy improvements in Olowalu/Ukumehame. I oppose all builds except maybe build 1 as long as this build doesn't demolish my wifes 2nd great grandmother's foundation located in the bushes right next to the old water tower/general store. (50) *I'm completely against build 4 and your purple project line is going right through the side of Pu'u Kilea and exactly where the oldest petroglyphs are located (50).*	50	Ch.1	18	The various alternatives (including a No Build Alternative that would keep the highway in its present location) were evaluated based on the technical environmental analyses conducted as part of the Draft EIS and this Final EIS. Overall, the No Build Alternative did not meet the Project's purpose and need because it leaves the existing highway vulnerable to coastal erosion and flooding and remains a less reliable transportation link to West Maui. However, the existing highway would continue to serve the community as a local road; it would carry far less traffic but still provide access to the Olowalu village center, homes, and business, as well as the beaches and parks in Ukumehame and Olowalu. Build Alternative 1 does pass through this area adjacent to the general store and water tower and could disturb the foundation mentioned in the comment. As detailed in Chapter 5, Preferred Alternative, of the Draft EIS, Build Alternative 1 in Olowalu was not selected as the Preferred Alternative based on several factors, including the complexity of the overlapping or proximity of the new alignment with the existing highway and its close proximity to the village center itself. Further, Build Alternative 4 was not identified as the Preferred Alternative because it has several environmental constraints associated with the mauka alignment. This included its proximity to the petroglyphs, which were identified as a likely adverse effect on land use, visual quality, and archeological and historic resources—including a noise impact at the location of the petroglyph. As described in Chapter 5 of the Draft EIS, the Preferred Alternative is based on Build Alternative 2 in Olowalu, which is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.
				If you look up old satellite images from 1950 and compare them to now the land looks exactly the same so what is the purpose of this? (51) *Is the land disappearing or is this a ploy to get Olowalu Town eventually passed? We don't want a new hwy that will increase taxes and bring in more millionaires. It's already hard enough to survive and the majority of kanaka have already been forced out due to the high cost of living. Only a few of the original families remain in Olowalu.*	51	Ch 1	10	As described in Chapter 1, Introduction, Purpose and Need, of this Final EIS, the Project's primary purpose is to provide a reliable transportation facility in West Maui and improve Honoapi'ilani Highway's resilience by reducing its vulnerability to coastal hazards. Specifically, the Project is intended to address existing coastal erosion and flooding vulnerabilities as well as future coastal erosion and flooding. The Project does not include land use actions or modifications to the existing zoning that would facilitate additional development in the surrounding area. Regarding the Olowalu Town Master Plan Project, on December 7, 2015, the State Land Use Commission denied the acceptance of the Final EIS and the project was discontinued. There are currently no filed applications or permits to indicate that the Olowalu Town Master Plan Project would be pursued again. In addition, should the Olowalu Town Master Plan Project (or a project of similar scope or nature) be proposed, it would likely be subject to approvals, potentially involving environmental review and associated public engagement requirements.
				After all of the attempts for olowalu town and now this hwy why is there still no attempts to protect our ancient sites like Kaiwaloa Heiau,Petroglyphs, and the many burials we have in Olowalu. (52) This includes my wifes ohana that is buried on top of Pu'u KIlea and the burials near our families land in Paumaumau Olowalu. We find people literally standing on top of the burials drinking and watching the sunset and they have no clue what they are standing on or they just don't care. The only thing protected in this area are the mansions and of course they recently put up a new gate blocking our access to the heiau. *So I say no to your new hwy and please fix what is already there (50 cont) .* Mahalo Jason	52, 50	Ch. 2	46, 18	Response 46: Chapter 3.6 of the Draft EIS and this Final EIS summarizes the extensive survey and research conducted by the Project's archeologists and historians. The results of the analysis to date have allowed for a refinement of the alignment of the Preferred Alternative to avoid and minimize disturbance of identified archeological and architectural historic resources, such as heiaus. Chapter 3.7 of the Draft EIS and this Final EIS provides a contextual history of the cultural resources of the project area. In coordination and continued dialogue with the community, there will be comprehensive testing for historic resources (Archaeological Inventory Survey or AIS) for the Selected Alternative, with testing protocol and mitigation requirements set forth in the Executed Programmatic Agreement as required by the National Historic Preservation Act and the Hawai'i Revised Statutes, Chapter 6E process. Consultation with descendants and other individuals and organizations with a demonstrated interest in the Project (referred to as "consulting parties") is ongoing as part of the Federal Section 106 and Hawaii 6E processes and will continue as the Project moves into final design and construction.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Jason Potts (continued)	-	25	Email & Webform					Response 18: The various alternatives (including a No Build Alternative that would keep the highway in its present location) were evaluated based on the technical environmental analyses conducted as part of the Draft EIS and this Final EIS. Overall, the No Build Alternative did not meet the Project's purpose and need because it leaves the existing highway vulnerable to coastal erosion and flooding and remains a less reliable transportation link to West Maui. However, the existing highway would continue to serve the community as a local road; it would carry far less traffic but still provide access to the Olowalu village center, homes, and business, as well as the beaches and parks in Ukumehame and Olowalu. Build Alternative 1 does pass through this area adjacent to the general store and water tower and could disturb the foundation mentioned in the comment. As detailed in Chapter 5, Preferred Alternative, of the Draft EIS, Build Alternative 1 in Olowalu was not selected as the Preferred Alternative based on several factors, including the complexity of the overlapping or proximity of the new alignment with the existing highway and its close proximity to the village center itself. Further, Build Alternative 4 was not identified as the Preferred Alternative because it has several environmental constraints associated with the mauka alignment. This included its proximity to the petroglyphs, which were identified as a likely adverse effect on land use, visual quality, and archeological and historic resources—including a noise impact at the location of the petroglyph. As described in Chapter 5 of the Draft EIS, the Preferred Alternative is based on Build Alternative 2 in Olowalu, which is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.
Tavor White	-	26	Webform	Maui has a dearth of mixed-use public spaces, other than perhaps beaches, where people can enjoy our beautiful corner of the planet. And, beaches are not conducive for bicycles. Our island is a small place. So, maximizing green areas is essential to our quality of life. I urge you to design and approve plans that do so. (53) Mahalo.	53	Ch. 3.5	44	As analyzed in the Draft EIS and this Final EIS, the Honoapi'ilani Highway Improvements Project is compatible with the long-term planning by Maui County regarding open space planning and future implementation of the West Maui Greenway. Consistent with long term planning initiatives such as the Pali to Puamana Parkway Master Plan, the Project has been part of a coordinated planning effort with Maui County regarding the use of County owned land in Ukumehame with intended shared use for the relocated highway and open space uses makai of the new road. In addition, HDOT has coordinated with Maui County regarding continued use and access to the Ukumehame Firing Range. In Ukumehame and Olowalu, the Project has also been in a coordinated planning effort with the State of Hawai'i DLNR. This coordinated effort aims to establish the location of the new highway alignment, and subsequently adding to the protection of public lands, by extending the Natural Forest Reserve over much of the department-owned property in the project area exclusive of the new highway alignment.
Dave Veldman	-	27	Email	Aloha Ken and members of the Committee! My name is David Veldman and I live in the Kaanapali Golf Estates. I have recently read about the proposed realignment of the Honoapi'ilani Highway. I am very supportive of the proposed 6.5 mile mauka relocation. (54) As planners for Maui's future this would seem to me to be an important component to safeguard the critical transportation corridor that serves West Maui.	54	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				I have also been aware of and fully support the West Maui Greenway vision. This is a terrific opportunity to create a dedicated bike and pedestrian path along the old highway. Repurposing this corridor into a scenic bike and pedestrian corridor is an obvious positive and would help further the vision of the West Maui Greenway. (55) Thank you for listening. Dave Veldman	55	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi'ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi'ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi'ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
Allen Surbida	-	28	Webform	Aloha, County/state must keep the Ukumehame Firing Range where it is and provide easy access to the only range we have. This project is great but developers should make sure that the range entries are kept open and easy accessible. (56)	56	Ch. 3.5	36	The Draft EIS and this Final EIS established and evaluated alternatives specifically with the understanding of the importance of the Ukumehame Firing Range to the community. As a public recreational resource, the firing range was further evaluated under the FHWA's obligation pursuant to Section 4(f) of the USDOT Transportation Act. Preservation of the use of the facility contributed to the identification of the Preferred Alternative such that the crossing of the new highway alignment was more makai than the original Build Alternatives 1 and 4 evaluated in the Draft EIS. By placing the alignment on a viaduct over the HDOT detention basin, the elevation of the viaduct will provide for a minimum of 20 feet of clearance for the existing firing range driveway, allowing for enough clearance for most emergency vehicles and trucks that may need to enter the facility.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
John Rafael	-	29	Webform	The Ukumehame Firing Range is the only public range on Maui. It needs to stay open and be easily accessible to the people. (57)	57	Ch. 3.5	36	The Draft EIS and this Final EIS established and evaluated alternatives specifically with the understanding of the importance of the Ukumehame Firing Range to the community. As a public recreational resource, the firing range was further evaluated under the FHWA's obligation pursuant to Section 4(f) of the USDOT Transportation Act. Preservation of the use of the facility contributed to the identification of the Preferred Alternative such that the crossing of the new highway alignment was more makai than the original Build Alternatives 1 and 4 evaluated in the Draft EIS. By placing the alignment on a viaduct over the HDOT detention basin, the elevation of the viaduct will provide for a minimum of 20 feet of clearance for the existing firing range driveway, allowing for enough clearance for most emergency vehicles and trucks that may need to enter the facility.
David Kingdon	-	30	Webform	I strongly support the reallocation of older, makai sections of the Honoapi'ilani Highway to be designated, redesigned, and *maintained* as a dedicated multi-use path for running, cycling, and allied activities. (58)	58	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi'ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi'ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi'ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				This should also include prohibition or limitation of the use of 'e-bikes,' as many of those are capable of traveling at higher or even highway speeds, which could pose a danger to those employing muscle-powered sport and recreation. (59) As a bicycle commuter, distance runner, and a paramedic serving this area of Maui, I can personally and professionally attest that dedicating this portion of H-pi'ilani for running, cycling and the like will both promote health and improve safety. Further, if well-engineered, maintained, and marketed, this could actually provide a world class 'hike & bike' path for residents and visitors alike. Maui should be actively seeking adventure travelers, who typically have a lower environmental impact, more cultural sensitivity, with the same or even higher economic injects as more sedentary travelers. Thank you for your consideration.	59	Ch. 3.5	33	The prohibition or limitation of the use of "e-bikes" is beyond the scope of the Honoapi'ilani Highway Improvements Project, and therefore this EIS.
Michele McLean	-	31	Webform	Please use roundabouts at intersections whenever possible. (60) Mahalo! -Michele.	60	Ch. 3.14	92	Roundabouts serve important transportation management functions and were evaluated for potential application as part of the preliminary design for the Honoapi'ilani Highway Improvements Project, although they have not been furthered as a design option. The project area has five intersections and for the Selected Alternative, two would be signalized to safely allow for pedestrian and bicycle crossings (which would generally not be appropriate for a free flowing roundabout). The other locations have limitations for the right-of-way necessary to implement a roundabout with the anticipated design capacity and free flow speeds of the new highway alignment. If the use of a roundabout is proposed at a future date, it would require further operational and environmental assessment.
Cesar Martin del Campo	-	32	Webform	Support for Honoapi'ilani Highway Improvements Project and Request for Correct Categorization of Parcel 48002115 To: Hawai'i Department of Transportation (HDOT) Subject: Public Comment on Honoapi'ilani Highway Improvements Project – Build Alternative 1. Dear Project Team, I am writing to express my support for the Honoapi'ilani Highway Improvements Project and its goals to improve transportation infrastructure while addressing environmental and safety concerns. (61) I appreciate the effort and planning involved in designing a project of this scale to benefit our community.	61	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				However, I would like to address a critical issue regarding the classification and evaluation of Parcel 48002115, which has been flagged for full acquisition under Build Alternative 1. It is essential that the property's current and planned uses are accurately reflected in the project documentation to ensure an equitable and informed process. 1. Misclassification of Parcel Use The current project documentation categorizes Parcel 48002115 as "not in use," which does not accurately reflect its status. Specifically: The parcel is actively utilized for grass farming operations, supported by established water connections and other agricultural infrastructure. (62) Farming activities are currently underway, generating revenue and contributing to the agricultural economy of the area. Additionally, the lot is being developed with architectural plans for a residential structure to complement its agricultural use. (62 Cont.) This active farming operation and planned development demonstrate that the parcel is a valuable and productive asset, rather than idle or undeveloped land. If you have any questions, please contact me. Cesar El Toro Zoysia Turf - Maui Grass Farm LLC.	62	Ch 3.4	29	During development of the Draft EIS in 2022 and 2023, property record searches along with field reconnaissance and review of Geographic Information Systems (GIS) mapping and data layers did not reveal the level of activity as described in the comment. HDOT recognizes that property ownership and use activities initiated by owners will change over time—especially in an area where subdivisions have occurred—and this information was updated accordingly in the Final EIS. Most importantly, any updated and current information will be integrated into the process of determining land value and fair compensation if the property must be acquired as part of the Project (see Chapter 3.4 of the Final EIS, which includes an explanation of how the Uniform Relocation Act establishes the protocol that must be followed in the acquisition process as well as HDOT's guidelines for right-of-way acquisition). In Ukumehame, Build Alternative 1 has been determined to be the basis of the Preferred Alternative, so the alignment is directly through Parcel 48002115. This indicates that a full acquisition of the parcel would be required. Once final design has determined the requirements for property acquisition, a representative of HDOT Right-of-Way will contact the property owner to start the process. The Final EIS Chapter 3.4 has been revised to reflect this updated information.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Anonymous 1	-	33	Testimony - Written	Shoreline access - Will the County also be working concurrently to provide shoreline access for the 6 mile stretch? What access to Ukumehame Beach Park and Thousand Peaks will be provided? Parking? (63)	63	Ch. 3.5	43	The new alignment of the Honoapi'ilani Highway would be mauka of the existing highway and would not provide direct access to beach areas. The roadway is proposed to be limited access only at intersections, with existing mauka to makai cross-streets. There would be no parking or pull-off areas along the new alignment. Beach access would continue to be available from the existing Honoapi'ilani Highway, which would become a County roadway and is expected to be integrated with the future plans for the Maui County West Maui Greenway. Once under County jurisdiction, the management of parking, access to adjacent beaches, and access to/from the greenway can be integrated into corridor planning.
	-			Squatting/ Homeless - How will the State/ County address safety and cleanliness along the shoreline? (64) The abandoned portion of cut mountain has become overtaken by homeless and abandoned vehicles.	64	Ch. 3.5	42	As stated in the Draft EIS and this Final EIS, encampments in the project area are an issue independent of the Honoapi'ilani Highway Improvements Project. HDOT is coordinating with other State and County officials in the ongoing management of encampments. Also discussed in the Draft EIS Chapter 5 presentation of the Preferred Alternative: when the new highway alignment connects with the existing Lāhainā bypass, the old/existing highway would be reconnected with the old highway segment that currently dead ends before the bypass. The isolated nature of the current configuration that contributed to this area's density of homeless encampments would be improved with the Project.
				Bike Lanes - How will cycling be addressed along the realignment and across the viaduct and bridge structures? (65)	65	Ch. 3.5	23	The preliminary design consideration did not include a separate pathway for non-motorized users, and all alternatives would incorporate a standard width shared-use shoulder lane that would accommodate bicyclists. This was intended to provide a direct route to and from the Pali and Lāhainā (including the viaducts and bridges) as a complement and interconnect with the primary bike route served by implementing the West Maui Greenway, which is proposed to be alongside the existing highway. Plans for the West Maui Greenway indicate the greenway is intended to provide a more substantial and integrated shared-use pathway that would be closer to the coastline and away from the main highway. However, based on these and other comments generated during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic (golf carts would not be allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway.
	-			Will a separate bike path along the shoreline be built? (66)	66	Ch. 2	32	The Honoapi'ilani Highway Improvements Project does not include development of the separate bike path along the shoreline. Maui County may implement plans for the West Maui Greenway and other potential shoreline recreational facilities sometime in the future.
Kathy Kihune	-	34	Testimony - Written	*Thank you for making the time to bring many stakeholders together from Olowalu and Ukumehame. It has been very informative and positive hearing the available/ potential routes in an effort to mitigate sea level rise along with environmental concerns. (67)* Applaud the open communication of your team. Mahalo.	67	Ch.1	1	Thank you for your comment and your interest in the Project.
Brandon Hazlet	-	35	Testimony - Written	For the Olowalu portion: use the mauka/ northern section of option #1 until it crosses option #2 then pick up that option. Basically use the uphill section of each 1&2 - a mauka hybrid - don't use the makai section of either. (68)	68	Ch. 2	20	This comment generally reflects the proposed refinements to the Selected Alternative made in consideration of public comments and refined design analysis.
Michele Lincoln	-	36	Testimony - Written	From past experience, SHPD does not verify accuracy of development information provided. Archaeologists and government departments are often more in compliance with the wishes of their employers and prospect of future work. For example, Kahoma Village reported no substantial historical importance. However , it was the homestead of David Malo LCA 3702, battle ground between Kam the Great and the high Chief of Maui, and part of the 'Alamihi Fishpond Complex. So, my suggestion is to consult with lineal descendants from each area the road goes thru to ensure pre-contact, iwi, and other cultural historical things are protected and preserved. (69) Least amount of impact to important Hawaiian sites. Iwi safes memorials for any disturbed iwi within the area.	69	Ch. 3.6	46	Chapter 3.6 of the Draft EIS and this Final EIS summarizes the extensive survey and research conducted by the Project's archeologists and historians. The results of the analysis to date have allowed for a refinement of the alignment of the Preferred Alternative to avoid and minimize disturbance of identified archeological and architectural historic resources, such as heiaus. Chapter 3.7 of the Draft EIS and this Final EIS provides a contextual history of the cultural resources of the project area. In coordination and continued dialogue with the community, there will be comprehensive testing for historic resources (Archaeological Inventory Survey or AIS) for the Selected Alternative, with testing protocol and mitigation requirements set forth in the Executed Programmatic Agreement as required by the National Historic Preservation Act and the Hawai'i Revised Statutes, Chapter 6E process. Consultation with descendants and other individuals and organizations with a demonstrated interest in the Project (referred to as "consulting parties") is ongoing as part of the Federal Section 106 and Hawaii 6E processes and will continue as the Project moves into final design and construction.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Anonymous 2	-	37	Testimony - Written	Please keep the communities as peaceful and untouched as possible. A highway through a community will change it forever, if possible please create the highway furthest away from infringing on local people. Please create a highway that encourages safety and more efficient transportation but discourages further development that does not enhance nor empower local people. (70) I hope the money allocated to the highway also gives money to remaining old, poor infrastructure and giving it back to the 'aina and for all locals to take care of and grow. I am confident we can find more creative solutions that empower and center our locals more. Federal funding is [illegible], but if we need more money to bring better solutions, I hope we pursue more money, maybe through private sources?	70	Ch. 2	19	In both Ukumehame and Olowalu, Build Alternative 4 was intended to represent the most mauka of alignments (that is, the most separation from the coast and inundation flood zones). The evaluation of this alignment showed that the distance from the coastline resulted in substantially more potential adverse effects on private property and other environmental considerations compared with Build Alternatives 1 and 2. As identified in Chapter 5 of the Draft EIS, the Preferred Alternative was selected based on Build Alternative 1 in Ukumehame and Build Alternative 2 in Olowalu. Build Alternative 4 was not identified as part of the Preferred Alternative, and the Preferred Alternative would not result in potential adverse effects to the referenced heiau. The Preferred Alternative avoids and minimizes effects on existing residences as well as cultural resources and other environmental considerations. The alignment does not create new development opportunities within the project area.
Anonymous 3	-	38	Testimony - Written	Safety - Will intersections have lighting, signals, emergency roadside phones etc...? (71)	71	Ch. 3.14	93	As established in the Draft EIS, Luawai Street in Olowalu would be a signalized intersection and, as detailed in this Final EIS and based on public comments and input, a second signalized intersection at Ehehene Street would part of the Project. Limited street lighting would be included at project intersections but not along the entire corridor. Consistent with HDOT policy, there would be no provision for emergency phones along the roadway given the prevalence and availability of cellular phones.
	-			Travel Lanes Surface - Will the road be asphalt or pccp? [concrete] (72)	72	Ch. 3.14	95	The roadway and shoulders will be constructed with concrete pavement. Side street tie-ins will be asphalt concrete pavement.
	-			Cultural Preservation - Will any monies/ resources be steered back to the communities of Ukumehame and Olowalu for preservation and education? (73)	73	Ch. 3.7	50	Preservation and education may be incorporated into mitigation strategies established in coordination with HDOT, the FHWA, the SHPD, and the community as required by the Federal Section 106 process and the Hawai'i Revised Statutes, Chapter 6E process. Potential mitigation measures are described in the Project's Programmatic Agreement, which was presented in draft form in the Draft EIS. The Executed Programmatic Agreement is included in this Final EIS (see Appendix 3.6). As described in the Executed Programmatic Agreement, the FHWA and HDOT, in consultation with the SHPD and Native Hawaiian Organizations, will continue consultation to determine if alternate mitigation under HAR § 13-275-8(2) is appropriate.
Anonymous 4	-	39	Testimony - Written	It would be great if the project included returning the shoreline of the original highway to a more natural state; with minimal shoreline hardening. I'm concerned that giving this responsibility to the County will just result in miles of homeless encampments like those on the old highway when the bypass went in. (74)	74	Ch. 3.5	42	As stated in the Draft EIS and this Final EIS, encampments in the project area are an issue independent of the Honoapi'ilani Highway Improvements Project. HDOT is coordinating with other State and County officials in the ongoing management of encampments. Also discussed in the Draft EIS Chapter 5 presentation of the Preferred Alternative: when the new highway alignment connects with the existing Lāhainā bypass, the old/existing highway would be reconnected with the old highway segment that currently dead ends before the bypass. The isolated nature of the current configuration that contributed to this area's density of homeless encampments would be improved with the Project. Parkland designations are beyond the scope of the Project. However, it is noted that the shoreline is largely accessible along the length of the existing highway (as well as from the Olowalu Beach and the Olowalu Sugar Mill historic site public access and parking) and includes two County parks. This would primarily be in the realm of Maui County because the Project includes transferring the jurisdiction of the existing highway to the County. Further, the final design and potential implementation of the West Maui Greenway, in combination with County-owned recreational lands in Ukumehame, would also be under County jurisdiction.
Linda Magallanes	-	40	Testimony - Written	Remove trees - prefer route 1. There are burials in the area where the preferred is located on the map. Very concerned about burials. (75)	75	Ch. 1, Ch. 3.6,	48	As detailed in Chapter 5 of the Final EIS, the Selected Alternative has been refined and modified to minimize and avoid sensitive archeological resources. There will be comprehensive testing for historic resources (Archaeological Inventory Survey or AIS) with mitigation protocols established through federal and State commitments (Section 106 and Section 6E). As stated in the Executed Programmatic Agreement (Appendix 3.6 of this Final EIS), mitigation of effects on significant historic properties may include preservation per HAR § 13-275-8. Such mitigation may include avoidance and protection (conservation), stabilization, rehabilitation, restoration, reconstruction, interpretation, or appropriate cultural use of the significant historic property. With regard to burials, the Maui/Lāna'i Island Burial Council (MLIBC) has the authority to determine treatment and jurisdiction over all requests to preserve or relocate previously identified Native Hawaiian burial sites. If a previously identified Native Hawaiian burial site will be affected by the project, HDOT, through its contractor, shall follow HAR § 13-300-33, Request for council determination to preserve or relocate Native Hawaiian Burial sites.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Jonathan Verona	-	41	Phone Call	Concern of the possible homeless camp and increase in homeless in the area between the existing Honoapiilani Highway and the Realigned Highway. (75)	75	Ch. 3.5	42	As stated in the Draft EIS and this Final EIS, encampments in the project area are an issue independent of the Honoapi'ilani Highway Improvements Project. HDOT is coordinating with other State and County officials in the ongoing management of encampments. Also discussed in the Draft EIS Chapter 5 presentation of the Preferred Alternative: when the new highway alignment connects with the existing Lāhainā bypass, the old/existing highway would be reconnected with the old highway segment that currently dead ends before the bypass. The isolated nature of the current configuration that contributed to this area's density of homeless encampments would be improved with the Project. Parkland designations are beyond the scope of the Project. However, it is noted that the shoreline is largely accessible along the length of the existing highway (as well as from the Olowalu Beach and the Olowalu Sugar Mill historic site public access and parking) and includes two County parks. This would primarily be in the realm of Maui County because the Project includes transferring the jurisdiction of the existing highway to the County. Further, the final design and potential implementation of the West Maui Greenway, in combination with County-owned recreational lands in Ukumehame, would also be under County jurisdiction.
Tamara Paltin	Maui County Council	42	Email	Aloha Ms. Takara and Ms. Sullivan, I am writing to provide comments pertaining to the Notice of Intent to Prepare an Environmental Impact Statement regarding potential improvements to the Honoapi'ilani Highway (State Route No. 30) between milepost 11 in the vicinity of Papalaua Wayside Park in Ukumehame and milepost 17 in Launiupoko. As stated in the Draft Notice of Intent, "Improvements are needed to provide a reliable transportation facility that would not be inundated by the predicted 3.2-foot sea level rise and undermined by coastal erosion." I firmly believe and strongly support the Honoapi**'ilani Highway's proposed 6.5-mile mauka relocation as a necessary step** in improving the safety and resilience of West Maui's transportation system. (76) The Federal Highway Administration began discussions on realignment, as early as June 2007. Since then, no advancements have been made. Now, swift action is needed to safeguard this essential highway from the growing threats posed by climate change and sea level rise, as well as ensure continuous connectivity for locals and tourists, who depend on this route for work and leisure.	76	Ch. 1	6	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken.
				Furthermore, I would like to encourage the Departments to think about implementing active transportation choices, particularly the West Maui Greenway (WMG) (77). Developed in 2022 as a vision for a proposed 25-mile multipurpose path that would connect Ukumehame to Lipoa Point, it can be viewed as a strategy to increase the region's resilience through sustainable, multimodal transportation for present and future generations. As such, I respectfully urge the Hawai'i Department of Transportation (HDOT) to prioritize the following key WMG elements within the project: Use of (Old) State Route 30 for Segments 6 and 7. Segments 6 and 7 (the southernmost sections, from Lahaina Pali Trailhead to Lauiniupoko Beach Park) of the WMG are best served by the current (Old) State Route 30 since it could offer a dedicated bike and pedestrian path. Transforming this scenic road into a continuously connected, pedestrian and bike-friendly corridor, would promote safe, nonmotorized travel and recreation, that also serves as a cost-effective means of connecting West Maui communities. (78)	77 78	Ch. 1 Ch. 3.5	31 31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi'ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi'ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi'ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				Conformity with Climate and Community Goals. Including the WMG in the highway realignment project is in line with Maui's commitment to climate resilience, as well as meets the Navahine v. Hawai'i Department of Transportation et al., Climate Settlement Agreement (2024), which requires the state to develop a plan to drastically reduce greenhouse gas emissions from the transportation sector with the goal of Zero Emissions by 2045. This multifunctional trail also promotes healthy lifestyles and augments disaster preparedness by serving as an evacuation route. Designed by the Community for Long-Term Benefits. Transforming Honoapi'ilani Highway into a recreational and commuting pathway would create a lasting community asset that boosts economic recovery, tourism, and public health. A designated bike and pedestrian path would promote environmental stewardship and community pride by offering secure, picturesque access to important natural and cultural landmarks. *As part of HDOT's broader goal to repair the coastal highway network from M**ā**'alaea to north of Lahaina, the Honoapi'ilani Highway Improvements Project will bring much-needed service dependability and resilience. This project also offers a rare chance to incorporate the West Maui Greenway as a crucial component of this reconstruction (76 Cont.).* *The August 2023 wildfires has forced our community to rethink present and future disaster recovery and infrastructure planning. Conversion of the former highway into a cycling and pedestrian path, as well as an evacuation route, will shape a legacy of sustainable infrastructure that will benefit West Maui for many years to come (76 Cont.).* I respectfully ask for your consideration of incorporating the West Maui Greenway into the Honoapi'ilani Highway Improvement Project, and I look forward to seeing this move forward with these important elements included. Thank you for your time and consideration of this critical matter. Please feel free to contact me at: Tamara.Paltin@mauicounty.us. Me ka 'oia'i'o, Tamara Paltin Councilmember	76 76	Ch. 1 Ch. 1	4 4	The West Maui Greenway project remains an independent initiative not led by HDOT. In the project area the West Maui Greenway is anticipated to eventually be integrated along the right-of-way of the existing Honoapi'ilani Highway which is anticipated to be relinquished to the Maui County one the Project is complete. In addition, based on comments received on the Draft EIS, the Selected Alternative as presented in this Final EIS will include a separated shared-use pathway along the makai edge of the new highway right-of-way, providing more multi-modal opportunities with the eventual and independent implementation of the West Maui Greenway.

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Nancy Haley	-	43	Zoom testimony	My name is Nancy Halley. I've been a resident of Maui for 40 years and I have listened to discussions about moving the highway back for a long time.· It's been going on for a long time, so I've kind of excited about that.· I could see how it could really benefit the island. I did have a question and I haven't read the EIS statements, I haven't read the paperwork yet so I really need to do that; and I will do that. But I was wondering about things that came into my mind were, you know, when all the -- unfortunately, all the -- the debris was moved to the Olowalu dump site and after the Lahaina fires and Bissen, Mayor Bissen, said that that will also be transported over to the Central Maui Landfill at one time. And so I'm just kind of wondering in my mind I was thinking how is that going to impact these plans for the highway? (79) There's been concern about the dump site -- the current dump site possibly leaching into the coastal waters off of Olowalu; and so I'm just kind of wondering. And then this whole movement of transport trucks moving back and forth to get to the Central Maui Landfill, so I'm just kind of wondering how that all ties into your EIS. Have you taken a look at that and do you think that your highway proposal would affect that in some way environmentally (79 Cont.) or, you know, I still have some questions about that.	79	Ch. 3.18	107	It is anticipated that the new roadway would begin construction after completion of removal operations and closure of the landfill. On October 27, 2023, the Board of Land and Natural Resource granted Maui County a land disposition to use the Olowalu Landfill to dispose of the Lāhainā wildfire ash and smaller particles. The debris would be wrapped in liners to prevent the migration of any waste materials and the landfill would again be capped and closed. Both the Temporary Debris Staging and Reduction site and the repurposed scale and weigh station are likely to be used for less than five years. The temporary uses related to disposal of debris from the Lāhainā wildfire is expected to stop prior to the development of the Project. Therefore, any affects to this facility or conflicts with the Lāhainā wildfire debris removal are unlikely. The new roadway would have an intersection with turning lanes and to serve the landfill site thus if any future transfer activities were to be undertaken, there would be roadway access to all for the movement of trucks and vehicles. The Selected Alternative does not disturb any disposal areas of prior landfill so construction of the roadway would not increase potential for off-site contamination. Evaluation of effects from the landfill would be part of the ongoing management of the closed landfill by the State of Hawaii.
Cesar Martin del Campo	-	44	Zoom testimony	Okay. It seems like the preferred alternative -- I know it's still not the final, but it seems like our property will be impacted in the Ukumehame subdivision. I was just wondering if there's going to be someone contacting us to understand the level of impact to our farming operations or who would be the best person for me to contact in order to have a discussion? (80)	80	Ch. 3.4	29	During development of the Draft EIS in 2022 and 2023, property record searches along with field reconnaissance and review of Geographic Information Systems (GIS) mapping and data layers did not reveal the level of activity as described in the comment. HDOT recognizes that property ownership and use activities initiated by owners will change over time—especially in an area where subdivisions have occurred—and this information was updated accordingly in the Final EIS. Most importantly, any updated and current information will be integrated into the process of determining land value and fair compensation if the property must be acquired as part of the Project (see Chapter 3.4 of the Final EIS, which includes an explanation of how the Uniform Relocation Act establishes the protocol that must be followed in the acquisition process as well as HDOT's guidelines for right-of-way acquisition). In Ukumehame, Build Alternative 1 has been determined to be the basis of the Preferred Alternative, so the alignment is directly through Parcel 48002115. This indicates that a full acquisition of the parcel would be required. Once final design has determined the requirements for property acquisition, a representative of HDOT Right-of-Way will contact the property owner to start the process. The Final EIS Chapter 3.4 has been revised to reflect this updated information.

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Saman Dias	Maui Bicycle League	45	Zoom testimony	Okay. Aloha. My name is Saman Dias and that is spelled S-a-m-a-n, last name D-i-a-s. And I am a Maui -- West Maui resident and have been on Maui over 25 years on the west side. And I'm also the chair for Maui Bicycling League. So I would like to first start with thanking the HDOT and FHWA and the consultants for a great job that you folks are doing. You are very appreciated. Maui Bicycling League do not oppose to the realignment.· However, we have -- we want to address some points to ensure part of the realignment that you folks do not forget the West Maui Greenway and all of you are very well aware and the community, as well. And Segments 3, 4, 5 and Segments 6 and 7 -- Segments 6 and 7 are getting affected by the realignment.· Segments 3, 4, 5 also received recently acknowledgment for race grant, so this 6/7 is really important to us.· We want to ensure that I'm calling it old highway after the new highway begins. The old highway is getting realigned with Segments 3, 4, 5 and the connectivity will continue to connect 6, 7 to 3, 4, 5.· So as part of the design of the old highway; it's important that we do not forget the West Maui Greenway 6 and 7; (81)	81	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi'ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi'ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi'ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				and it should be part of the design to incorporate the bicycle/pedestrian pathways specifically safe for our children, as well as for Kupuna.· So do not forget that. And, also, the new highway it is really important that we incorporate somehow safe bicycling and pedestrian crossing.· Very important, do not forget the pedestrian covered crossing to be incorporated to the new highway. (82)	82	Ch. 1	23	The preliminary design consideration did not include a separate pathway for non-motorized users, and all alternatives would incorporate a standard width shared-use shoulder lane that would accommodate bicyclists. This was intended to provide a direct route to and from the Pali and Lāhainā (including the viaducts and bridges) as a complement and interconnect with the primary bike route served by implementing the West Maui Greenway, which is proposed to be alongside the existing highway. Plans for the West Maui Greenway indicate the greenway is intended to provide a more substantial and integrated shared-use pathway that would be closer to the coastline and away from the main highway. However, based on these and other comments generated during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic (golf carts would not be allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway.
				And you all are aware of the Navahine Settlement Agreement where HDOT has made commitments to reducing the carbon footprint and please use this as a opportunity to build that bike network that you all are supposed to complete in year 2030. (83) So these are just reinforcing, I have been talking to you folks on every opportunity.· I also had sent testimonies and I'm just stating this opportunity as a way to remind again.· And mahalo and thank you so much.	83	Ch. 3.5	23	

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Karen Comcowich	-	46	Zoom testimony	I'm a West Maui resident. I drive the Honoapi'ilani Highway multiple times a week for commuting to and from work and I fully support this project because I see the wave impacts that are happening around the highway. (84)	84	Ch. 1	5	Thank you for your comment and your interest in the Project.
				I would like to echo what Saman said that it's really important to have pedestrian access that goes across the highway and to ensure that the bicycle alignments are respected and that safe bicycling infrastructure is included in the plan. (85)	85	Ch. 2	23	The preliminary design consideration did not include a separate pathway for non-motorized users, and all alternatives would incorporate a standard width shared-use shoulder lane that would accommodate bicyclists. This was intended to provide a direct route to and from the Pali and Lāhainā (including the viaducts and bridges) as a complement and interconnect with the primary bike route served by implementing the West Maui Greenway, which is proposed to be alongside the existing highway. Plans for the West Maui Greenway indicate the greenway is intended to provide a more substantial and integrated shared-use pathway that would be closer to the coastline and away from the main highway. However, based on these and other comments generated during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic (golf carts would not be allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway.
	-			I would also like to say that there should be a location where there's some sort of passing zone (86) because one of the dangerous things that does happen is getting stuck behind visitors who are -- who are sightseeing while people are commuting, encourages people to pass in unsafe ways. So if there's just a passing zone so people can get around the slower drivers.	86	Ch. 1	7	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. The initial project construction would clear, grade and provide infrastructure (bridges and culverts) and be ready to accommodate four lanes. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. Based on comments made during the Draft EIS public comment period and at the public hearings, the HDOT will evaluate in the design build process the potential for including a passing lane segment as part of the initial build-out.
	-			And past that, avoiding kuleana parcels as much as impacts the kuleana parcels as much as possible. (87) I was impressed that archeological resources and the environmental resources have been thought about as much as they have in the plan. And that's all my comments for now. I'll submit written comments.	87	Ch. 3.4	30	Chapter 3.4 of the Draft EIS and this Final EIS specifically identifies kuleana parcels and evaluates the effects of the Project on those parcels. The Preferred Alternative minimizes the potential impacts on the five affected kuleana parcels in both Olowalu and Ukumehame. HDOT must comply with the Hawai'i State Eminent Domain Law, which establishes the public purpose and acquisitions procedures for private property acquisition by the State of Hawai'i. In complying with the law, the individuals affected by land acquisition would have a transparent process to follow and a full understanding of their rights to just compensation.
Teje Roy	-	47	Zoom testimony	I'm agreeing with everyone else. I do drive the Pali a lot, like four times a week; and getting stuck behind slow drivers and then having crazy fast drivers trying to pass in the bad areas I think maybe widening the roads in certain areas for passing would be great. (88)	88	Ch. 3.14	7	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. The initial project construction would clear, grade and provide infrastructure (bridges and culverts) and be ready to accommodate four lanes. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. Based on comments made during the Draft EIS public comment period and at the public hearings, the HDOT will evaluate in the design build process the potential for including a passing lane segment as part of the initial build-out.
	-			And then also I just want to go on the record; I don't really -- I mean, I understand Route 3 and 4 just from looking at the maps, but they do worry me a little bit because they go by the petroglyphs and recently the petroglyphs have been getting vandalized.· And so I'm afraid it would kind of instigate more of that happening (89) or maybe even roadblocks or traffic jamming up there from people pulling over to look; and that area doesn't really have a lot of parking space for people to be pulling over and looking at them. So I'd ask you guys if you do go Route 3 and 4 to take that into consideration; and that's all I really have to say. I do want to read up more on this. There's a lot to read up on.· So -- but, yeah, that's all I'd like to say.	89	Ch. 2	18	The various alternatives (including a No Build Alternative that would keep the highway in its present location) were evaluated based on the technical environmental analyses conducted as part of the Draft EIS and this Final EIS. Overall, the No Build Alternative did not meet the Project's purpose and need because it leaves the existing highway vulnerable to coastal erosion and flooding and remains a less reliable transportation link to West Maui. However, the existing highway would continue to serve the community as a local road; it would carry far less traffic but still provide access to the Olowalu village center, homes, and business, as well as the beaches and parks in Ukumehame and Olowalu. Build Alternative 1 does pass through this area adjacent to the general store and water tower and could disturb the foundation mentioned in the comment. As detailed in Chapter 5, Preferred Alternative, of the Draft EIS, Build Alternative 1 in Olowalu was not selected as the Preferred Alternative based on several factors, including the complexity of the overlapping or proximity of the new alignment with the existing highway and its close proximity to the village center itself. Further, Build Alternative 4 was not identified as the Preferred Alternative because it has several environmental constraints associated with the mauka alignment. This included its proximity to the petroglyphs, which were identified as a likely adverse effect on land use, visual quality, and archeological and historic resources—including a noise impact at the location of the petroglyph. As described in Chapter 5 of the Draft EIS, the Preferred Alternative is based on Build Alternative 2 in Olowalu, which is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Jason Potts	-	48	Zoom testimony	Is there a way to ask questions on here or it's just for comments?· Sorry. Okay. My question was, like, with the -- the highway that's already there, specifically in Olowalu, what is going to be done with that? (90) I haven't heard anything about that so I'm a little confused.	90	Ch.1	18	The various alternatives (including a No Build Alternative that would keep the highway in its present location) were evaluated based on the technical environmental analyses conducted as part of the Draft EIS and this Final EIS. Overall, the No Build Alternative did not meet the Project's purpose and need because it leaves the existing highway vulnerable to coastal erosion and flooding and remains a less reliable transportation link to West Maui. However, the existing highway would continue to serve the community as a local road; it would carry far less traffic but still provide access to the Olowalu village center, homes, and business, as well as the beaches and parks in Ukumehame and Olowalu. Build Alternative 1 does pass through this area adjacent to the general store and water tower and could disturb the foundation mentioned in the comment. As detailed in Chapter 5, Preferred Alternative, of the Draft EIS, Build Alternative 1 in Olowalu was not selected as the Preferred Alternative based on several factors, including the complexity of the overlapping or proximity of the new alignment with the existing highway and its close proximity to the village center itself. Further, Build Alternative 4 was not identified as the Preferred Alternative because it has several environmental constraints associated with the mauka alignment. This included its proximity to the petroglyphs, which were identified as a likely adverse effect on land use, visual quality, and archeological and historic resources—including a noise impact at the location of the petroglyph. As described in Chapter 5 of the Draft EIS, the Preferred Alternative is based on Build Alternative 2 in Olowalu, which is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.
	-			Okay. And then my other question was I noticed on the map that the – where was it? So it's your preferred build that's going to go through two of those large rock mounds from the old like sugarcane· company, right? I've been told that there's possibly bones in that, so what will be happen -- like, what will happen if you guys find bones during construction? (91)	91	Ch. 3.6	51	For the entire Project, there are rigorous requirements in the testing for potential burials in the final design alignment and standing mitigation procedures if iwi (or unanticipated remains) are discovered during construction. As stated in the Executed Programmatic Agreement (Appendix 3.6 of this Final EIS), mitigation of effects on significant historic properties may include preservation per HAR § 13-275-8. Such mitigation may include avoidance and protection (conservation), stabilization, rehabilitation, restoration, reconstruction, interpretation, or appropriate cultural use of the significant historic property. With regard to burials, the Maui/Lānaʻi Island Burial Council (MLIBC) has the authority to determine treatment and jurisdiction over all requests to preserve or relocate previously identified Native Hawaiian burial sites. If a previously identified Native Hawaiian burial site will be affected by the project, HDOT, through its contractor, shall follow HAR § 13-300-33, Request for council determination to preserve or relocate Native Hawaiian Burial sites. A note specific to the push pile mounds identified in the comment: based on other public comments and the evaluation of design refinements, the Selected Alternative has been adjusted so the roadway avoids these push piles.
	-			Okay. Perfect, yeah. And I did submit testimony. It was through email. I'm not sure if you got it. My wife did, also. Her family owns kuleana in the back near the petroglyphs, so hopefully, you got our testimony. That's pretty much it. I just had those questions, so appreciate your time. Thank you.				

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Daniel Ornelas	-	49	Webform	Please consider making the road 4 lanes when built to allow better flow of traffic for those that commute to the west side for work. Impatient motorists stuck behind those driving below the speed limit routinely drive aggressively through this section in order to pass clusters of slower drivers. Building 2 lanes either direction will allow these motorists to safely pass slower drivers and reduce congestion through Lahaina. (92)	92	Ch. 1	8	As stated in in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. In addition, HDOT will evaluate in the design build process the potential for including a passing lane segment as part of the initial build-out.
Elaine Baker	-	50	Webform	Routing across any portion of the closed Olowalu Landfill should be avoided so that buried waste is not exposed to the environment. (93)	93	Ch. 3.18	107	It is anticipated that the new roadway would begin construction after completion of removal operations and closure of the landfill. On October 27, 2023, the Board of Land and Natural Resource granted Maui County a land disposition to use the Olowalu Landfill to dispose of the Lāhainā wildfire ash and smaller particles. The debris would be wrapped in liners to prevent the migration of any waste materials and the landfill would again be capped and closed. Both the Temporary Debris Staging and Reduction site and the repurposed scale and weigh station are likely to be used for less than five years. The temporary uses related to disposal of debris from the Lāhainā wildfire is expected to stop prior to the development of the Project. Therefore, any affects to this facility or conflicts with the Lāhainā wildfire debris removal are unlikely. The new roadway would have an intersection with turning lanes and to serve the landfill site thus if any future transfer activities were to be undertaken, there would be roadway access to all for the movement of trucks and vehicles. The Selected Alternative does not disturb any disposal areas of prior landfill so construction of the roadway would not increase potential for off-site contamination. Evaluation of effects from the landfill would be part of the ongoing management of the closed landfill by the State of Hawaii.
				Routing across any portion of the Olowalu Recycling and Refuse Center will result in a reduction of solid waste services for West Maui. (94)	94	Ch. 3.17	106	As presented in Chapter 3.17 of the Draft, the Preferred Alternative (and all alternatives evaluated) would be anticipated to result in the displacement and relocation of the existing County of Maui recycling and transfer station. Based on information provided by the County, the location at the landfill was not considered a permanent solution and the County has long considered relocation options for this facility to move it closer to the Lāhainā urban center, where most users originate.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Saman Dias	Maui Bicycling League	51	Email & Webform	Aloha, I am writing to provide testimony on the Honoapi‘ilani Highway (State Route 30) realignment and strongly urge HDOT and FHWA to incorporate the West Maui Greenway (WMG) as part of this project. This realignment presents an unprecedented opportunity to enhance multimodal transportation, improve emergency evacuation infrastructure, and align with long-standing but unfulfilled state policies—most notably Act 214 (2007), which mandated the use of cane haul roads for emergency evacuation. 1. HDOT’s Failure to Implement Act 214 – A Costly Oversight. The 2007 Act 214 directed HDOT to incorporate cane haul roads into emergency evacuation planning. Yet over 100 lives were lost in the August 2023 Lahaina fire—many of which could have been prevented had these evacuation routes been open and accessible. The Honoapi‘ilani Highway realignment must correct this tragic failure by formally incorporating cane haul roads as emergency evacuation routes. HDOT must negotiate with private landowners for right-of-way access and develop permanent emergency routes as part of this highway realignment. Failure to integrate emergency evacuation routes now would be a continuation of HDOT’s past neglect and put West Maui residents at continued risk. (95)	95	Ch. 1	12	The objective of Act 214 is to provide alternative routes if the highway is closed. The Project’s new highway alignment, in combination with connections to the existing highway that will become a local roadway, generally supports the objectives of Act 214. There is no continuous north-south cane haul road network parallel to the existing highway and only a handful of mauka-makai cane haul roads in the project area. The existing roadway from Olowalu center towards the petroglyphs is being preserved. In the project area, subdivision streets are the primary mauka-to-makai travel ways including North Street and Luawai Street in Olowalu and Ehehene Steet and Pōhaku ‘Aeko Street in Ukumehame. The proposed highway realignment will have two signalized intersections that will provide access to the existing highway from the realigned highway.
				2. West Maui Greenway as a Vital Multimodal Corridor & Emergency Route. The West Maui Greenway (WMG), identified in the Hele Mai Maui Legacy Projects, is a critical component of West Maui’s future transportation network. This project is already funded in part and aligns with state and federal transportation priorities. Use of (Old) State Route 30 for WMG’s Segment 6: The realigned Honoapi‘ilani Highway creates a perfect opportunity to repurpose the old highway as a dedicated bike/pedestrian corridor. (96) This cost-effective solution promotes safe, non-motorized travel while doubling as an emergency evacuation route for residents and visitors. Conformity with Climate & Community Goals: Navahine Settlement Agreement (2024): HDOT must drastically reduce transportation-sector greenhouse gas emissions and prioritize multimodal solutions. Act 131 & Complete Streets Policy: State law mandates that new highways must be bike-friendly and accommodate pedestrians. (95 cont.) The WMG achieves this.	96	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				3. Current Funding & Alignment with Federal/State Priorities. The WMG has secured substantial funding, and it is listed as a priority in multiple state and federal programs: $15 million RAISE Grant – Federal funds awarded for WMG implementation. Inclusion in the Statewide Transportation Improvement Program (STIP) – Recognized as a priority transportation project for Hawai‘i. Hele Mai Maui MPO Plan & Hawai‘i Bike Plan – Officially designated as a core component of Maui’s transportation future. With this funding in place, HDOT must act immediately to integrate WMG into the highway realignment. Delays in implementation put these funds at risk.				
				4. A Safer Highway for Bicyclists & Pedestrians. The new Honoapi‘ilani Highway must not repeat past mistakes—it must be designed with safety in mind: Separated Bike Lanes & Pedestrian Crossings: The highway realignment must include protected bicycle infrastructure, in accordance with the Complete Streets Policy & Act 131. Safe pedestrian crossings must be prioritized to reduce conflict with vehicle traffic. Disaster Preparedness Through Smart Design: The WMG serves dual purposes—as a transportation corridor and evacuation route in case of future wildfires or climate-related disasters (97)	97	Ch. 2	23	The preliminary design consideration did not include a separate pathway for non-motorized users, and all alternatives would incorporate a standard width shared-use shoulder lane that would accommodate bicyclists. This was intended to provide a direct route to and from the Pali and Lāhainā (including the viaducts and bridges) as a complement and interconnect with the primary bike route served by implementing the West Maui Greenway, which is proposed to be alongside the existing highway. Plans for the West Maui Greenway indicate the greenway is intended to provide a more substantial and integrated shared-use pathway that would be closer to the coastline and away from the main highway. However, based on these and other comments generated during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic (golf carts would not be allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway.
				Conclusion & Urgent Request for Action. The Honoapi‘ilani Highway realignment is not just a highway project—it is a life-saving infrastructure upgrade. HDOT must implement the long-overdue Act 214 (2007) by formally incorporating cane haul roads as emergency evacuation routes. WMG’s Segment 6 must be integrated into the old highway to maximize the state’s investment in safe, sustainable transportation. The new highway must be bike-friendly, pedestrian-accessible, and aligned with state & federal multimodal goals. This is a critical moment for West Maui. HDOT and FHWA cannot afford to overlook these urgent priorities. I urge immediate action to ensure no more lives are lost due to lack of proper evacuation routes. Mahalo for your time and consideration. Respectfully submitted, Saman Dias Chair, Maui Bicycling League				

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Kellee Emmerich	-	52	In-person verbal testimony	Hi, my name's Kellee Emmerich. I have been a Lahaina resident for almost 40 years. We owned a home on Lahainaluna Road. And during the Lahaina Fire we lost our home. One of my children, my daughter, and her family also lost their home in Wahikuli. And after living in -- at the Hyatt for eight months we were -- it was very healing to move to Ukumehame. We bought a property in Ukumehame. And we put two tiny houses there, which we are farming now. We have chickens. We planted over 20 trees. And we have a barn that we're going to be building. And so it would be very inconvenient and disappointing if -- the higher up the highway was, it would be possibly affecting our property. And so my request is that it goes as low as possible through County land rather than through the resident or the residential areas or the agricultural areas or, yeah, private property. I'm concerned also about the noise from the road noise. The closer up it comes to the --where the people are living. So my request is that it would just stay as low as possible on the highway (98). I think that's it.	98	Ch. 2	21	In Ukumehame, the most mauka alignment (Build Alternative 4) was not identified as the Preferred Alternative for many of the environmental constraints noted in the comment, including a high number of private property takings. The Preferred Alternative is primarily on State and County lands, with a more makai alignment than Build Alternative 4 but mauka of Build Alternative 2/3 and the existing highway to avoid the inundation and flood zones to the extent possible. As detailed in Chapter 3.4 of the Draft EIS and this Final EIS, property acquisitions and displacement of existing residences must follow the rigorous procedures of the federal Uniform Relocation Act. As presented in Chapter 3.16 of the Draft EIS and this Final EIS, there are no impacts from increased noise levels generated by the Preferred Alternative and no abatement is warranted.
Brad Emmerich	-	53	In-person verbal testimony	So after the fire I realized that this is going to be something that takes a long time. And so I needed to find a house or something -- a place for my family to live. So that's when we lived at property there in Ukumehame. I originally was trying to find a friend or something like that or somebody that was wanting to allow me to put a -- either a mobile home or something on their property. That's when somebody said, "Well, why don't you just look at the ones there in Ukumehame?" Which we had looked at earlier in the year but it was out of our ability. Anyway, to make a long story short, so after the fire I realized it was going to take a long time before we could rebuild. So we went and found something there in Ukumehame. And, like Kellee was saying, we were at the Hyatt for eight months. So while we were there we were working hard at trying to build something in Ukumehame. But it was difficult getting through all the process.				
	-			At any rate, now that we're there, of course, we really like the property and so we're more invested in what happens as far as the road is concerned. And there is property below us – the property that's next to the highway that is all County property. And there are “no trespassing” signs all over. But of course people have moved in there and, you know, they put up homesteads really -- gates and fences and right next to the "no trespassing" signs. (99) But it just -- it makes sense to me that the State would put the highway there at the County property at the bottom of Ukumehame development.	99	Ch. 2	21	In Ukumehame, the most mauka alignment (Build Alternative 4) was not identified as the Preferred Alternative for many of the environmental constraints noted in the comment, including a high number of private property takings. The Preferred Alternative is primarily on State and County lands, with a more makai alignment than Build Alternative 4 but mauka of Build Alternative 2/3 and the existing highway to avoid the inundation and flood zones to the extent possible. As detailed in Chapter 3.4 of the Draft EIS and this Final EIS, property acquisitions and displacement of existing residences must follow the rigorous procedures of the federal Uniform Relocation Act. As presented in Chapter 3.16 of the Draft EIS and this Final EIS, there are no impacts from increased noise levels generated by the Preferred Alternative and no abatement is warranted.
	-			And then my other concern was the noise mitigation -- if there was a way that they could --they would certainly -- my hope would be they would consider that because right now we can hear the highway noise. But when we go inside, you know, then at least you can't hear it when you're inside. But if the highway was closer it gets louder. And so my hope would be that they would take that into consideration also since we are a resident – that they would do something to try to mitigate the noise -- lessen the noise. (100) That's it.	100	Ch. 2	21	

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Raymond Ishii	-	54	In-person verbal testimony	Hi, my name is Raymond Ishii. Is this thing on? Okay. I'm the president of the Valley Isle Sports Shooters Club, which is the oldest and largest user of Ukumehame Firing Range. While I fully support moving the existing highway, in that there are a number of concerns I have. The roads appear to run parallel to fire lines, which we are very grateful for, although there is a couple routes that were uncomfortably close. But my understanding is that's going to change.				
	-			The questions I have is right now to access the range and the Papalaua Wayside Park we have to drive past the range via the Viaduct exit to the Ukumehame subdivision, then backtrack on the existing highway. (101) The question I had, which was actually answered, was is the State going to maintain that highway to a correct standard where you can actually drive on it. And I was told that's going to be turned over to the County. So that's a County question now. Because that section of road – if anybody's driven it -- is probably going to fall in the ocean pretty soon. Because if you look every so often you'll see the -- basically the ocean undercutting the existing jersey barriers. So the question I have is, number one, is that road going to be maintained? (101 Cont.)	101	Ch. 3.5	38	The routing as described is correct. For the existing highway it is noted that the Project would result in the transfer of jurisdiction from HDOT to Maui County as a local roadway. The existing highway would have substantially less traffic demand after the realigned highway is open, and the intent would be for the County to maintain the road in a manner that improves environmental sensitivity (that is, less hardened shoreline structures) and includes the West Maui Greenway and other planning initiatives. The Nature Conservancy and University of Hawaii are currently studying the coastal zone in Olowalu and Ukumehame (including the existing highway alignment) to identify nature-based solutions that strengthen coastal ecosystems and resilience. While, as noted, this section of the existing highway is vulnerable to coastal erosion, it also serves important County uses including the firing range, Ukumehame Beach, and Pāpalaua Wayside Park.
				The second question I have -- to avoid that, prior on the left side of the bypass would it be possible to just simply restripe existing road and put in a turn lane so we can get direct access and not have to basically bypass everything? That will give access to both the range and the beach park. (102) Then, going back the other way, a merge lane.	102	Ch. 3.5	39	The option of having an intersection at the Pali terminus of the Project to maintain access to the old highway was reviewed and evaluated by the conceptual design team. However, the option was determined infeasible due to the angle of departure of the new highway both horizontally and vertically—the new highway must rapidly ascend an existing berm for the detention pond that is makai of the firing range—and the limited space that results from these geometric constraints. In short, the limited geometry leads to the inability to provide a safe intersection in this area.
	-			My understanding is a viaduct is going to be 25 feet high, which is good so emergency vehicles can go under it. But the other question we had was during construction will people be allowed access basically to the range because they're going to build the viaduct over the existing road? (103) And that's it for the range.	103	Ch. 3.5	40	Because the viaduct would be constructed with piers on either side of the firing range driveway, the construction-related disruption to the driveway itself would be short-term. While the viaduct structures are being placed across the driveway from pier to pier, the driveway could be temporarily closed. The design build contractor would be required to coordinate construction phasing and sequencing in this area with Maui County Parks and Recreation (the owner and operator of the firing range).
	-			I have one comment though as far as the highway itself -- if there's any thought about putting protected passing lanes on that highway? Because if anybody's driven it, what happens is you get behind somebody going 20, 30 miles an hour and you got a line of cars, you know, half mile, mile long. Then you get one guy ten cars back who's late for work and he's going to start passing people. So has there been any thought about putting passing lanes on that highway? Not the whole thing but just intermittently to let people around slow people. (104) That's all I got.	104	Ch. 1	7	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. The initial project construction would clear, grade and provide infrastructure (bridges and culverts) and be ready to accommodate four lanes. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. Based on comments made during the Draft EIS public comment period and at the public hearings, the HDOT will evaluate in the design build process the potential for including a passing lane segment as part of the initial build-out.
David McPherson	-	55	In-person verbal testimony	Hi, my name is David McPherson. I live in Kipuka Village. Most people know it as Olowalu Village. I've been there for about ten years with my family. As we look at the alternate routes, it seems -- and I would like to see it go a little bit higher away from the homes. There's a lot more space Mauka.Hopefully there's no park sites or anything that would be -- that would hinder that to be pushed further away from our homes. We have a small little village there. And it seems like it goes, you know, fairly close. So that's one thing that I would really like to see happen is that it would be pushed further away from our homes for the noise. (105)	105	Ch. 5	112	There have been several comments looking to move the Preferred Alternative further mauka from its alignment as presented in the Draft EIS. These comments have been reviewed and incorporated into the refinements of the Selected Alternative, and the result would be a more mauka alignment (up to approximately 200 feet of the original alignment). Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS. In terms of noise, there was no impact on the homes in the Kapāiki Village area from the Preferred Alternative as analyzed in the Draft EIS. Based on the removal of the high volume of through traffic on the existing highway, the homes in this area would experience a decrease in noise levels over the No Build condition (see Chapter 3.16 of the Draft EIS and Final EIS).
	-			And second of all, for the design team, if you thought about putting guardrails up (106) -- I know guardrails are to stop cars when there's no other runways that they can slow down. But guardrails keep vagrants out of State-covered lands. And that's a really – putting guardrails up would save our County and State dollars in not having to clean up cars. (106) I mean, if you do the stretch from Olowalu to Ukumehame you're going to see cars littered up there, especially if you take a helicopter and you fly over. It is unbelievable. And that takes a lot of money, a lot of effort, and it damages our wetland areas. So to keep everybody out of there, guardrails would eliminate anybody really driving into State-covered land or places that they should not be trespassing. (106) That's just one thing that I wanted to say on that.· Thank you, everybody, for coming. Appreciate it.	106	Ch. 2	22	Guard rails will be included along both sides of the new highway.

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Jason Wolford	-	56	In-person verbal testimony	Good evening. My name's Jason Wolford. I'm with SAST. We're a nonprofit training organization at Ukumehame Firing Range. (107) We're a nonprofit. We teach firearm safety and training. My concern is along with the fires when the range was closed -- people need accesses through that. So during the construction are we still going to be able to access that? (107) Because people want to go hunt. They need to be able to sight rifles in for ethical hunting purposes and things like that. If it's shut down another six to eight months during the construction of that, you're just going to have people going other places shooting and as well as being able to take firearms, classes, and trainings -- and safety trainings -- which is required by the State of Hawaii. You're basically going to be locking people out of access to these constitutional rights as well if we don't have access to that.	107	Ch. 3.5	40	Because the viaduct would be constructed with piers on either side of the firing range driveway, the construction-related disruption to the driveway itself would be short-term. While the viaduct structures are being placed across the driveway from pier to pier, the driveway could be temporarily closed. The design build contractor would be required to coordinate construction phasing and sequencing in this area with Maui County Parks and Recreation (the owner and operator of the firing range).
	-			And my second question is I understand they're making it three lanes for finances and things like that. What happens when there's an accident on that elevated roadway? Whether there's guardrails and the vehicles are stopped there and people need to get through or -- how are you going to get people off of that? (108) If there's a fatality we all know the road shuts down here for six to eight hours. How are people going to get off of that elevated roadway to be able to at least go one way or the other to get back somewhere else rather than sitting in their cars for six to eight hours?	108	Ch. 5	118	The viaduct will have 6-foot-wide shoulders, 11-foot-wide travel lanes (one in each direction) and a 4-foot wide median, providing a total roadway width of 38-feet plus a shared use path. This width is anticipated to be adequate to provide the passage of vehicles should an accident occur either by having vehicles pulling to the side (and passing vehicles utilizing the median space to pass) or in more severe cases the use of a single contraflow lane with the assistance of Maui Police Department.
Van Fischer	-	57	In-person verbal testimony	Hello, my name is Van Fischer. I own six acres in Olowalu right where the wai stream goes up right below where the proposed highway is going to go through. Fortunately, the new highway that's proposed barely clips the corner of my property. So I'm grateful that it misses mine. But my neighbors are not so fortunate. I'm here to ask you to move the intersection of Luawai and the highway Mauka, like, 150 feet for a number of reasons. One, the way that it hits Luawai Street now is at an angle so it doesn't create a right-angle intersection. (109) So you're going to have to realign the side roads as opposed to realign the highway. If you just move the proposed highway up about 150 feet it changes the arc of the highway as it comes through. And then it hits Luawai Street at a right angle so you have a proper intersection. That intersection's going to need to be signalized because it's going to be a very busy intersection going down into Olowalu Village. (109)	109	Ch. 5	111, 113	Response 111: These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable, most notably with a mauka shift of the roadway. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS. Response 113: As indicated in the Draft and Final EIS, this intersection is proposed to be fully signalized.
	-			Another issue is that on the back of our property lines -- Lot 20 and Lot 19 -- there's a subservice tributary to Mapua Stream. And there's an old pumphouse right where you're putting your highway through where if you go down in there you can see there's water flowing under there. And that is a tributary into Mapua Stream, (110) which runs right through mine and Dave's property just down further. The rest of Mapua Stream up above is also subterranean. But in the section through our property it's an open stream and there's tons of life in there. And we would like to protect it and enhance it if possible. And putting the highway through there is not going to accomplish that. (110)	110	Ch. 5	115	These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS. During final design further geotechnical studies would be conducted related to the limits of disturbance. These studies would identify subsurface conditions (including potential underground streams) and potential design modifications would be evaluated based on those findings.
	-			There is a substantial topography difference between the area where the highway can go right above Lots 19 and 20 as opposed to below. There's about a 12-foot vertical bank. And if it were moved up then you wouldn't have to deal with that bank. (111) If you do have to deal with the bank, behind my property's going to be a 20-foot-high embankment to support that highway up there. So for these reasons I'd like to ask that you move it.	111	Ch. 5	114	These comments have been reviewed and incorporated into the refinements of the Selected Alternative to the extent practicable, most notably based on the mauka shift of the roadway as noted by the comments. Modifications to the Selected Alternative are summarized in Chapter 5, Selected Alternative, of this Final EIS.
	-			The most important reason probably is that right where you go through Lot 20 there was two parcels there -- A and B -- just on the southside of the wai stream where there was two two-and-a-half-acre parcels there with two local families who are in contract to buy those to build their homes on. (112) And now they can't build their homes there. You're going right through those properties. And all it would take is to move it 150 feet Mauka into an open space tract that's already there that nobody's going to be building on. (112) So I would appreciate it if you would look into it. I feel really good. I spoke with Jamie about this and I feel like she really understood and cared about what I was saying. So I'm hopeful that you will take this into consideration. Thank you.	112	Ch. 5	117	These comments have been reviewed and incorporated into the refinements of the Selected Alternative.
Nick Nielson	-	58	In-person verbal testimony	Hello, my name is Nick Nielson. I'm a property owner in Ukumehame. Most of my concerns have been addressed so far so I'm just going to note one concern for us. We're kind of concerned about the hours of construction – if there's going to be limits or it's going to be a 24-hour operation and how that noise will be addressed and recorded before and after construction. Will there be a decibel meter at our location now and that's compared to construction? (113) That's it.	113	Ch. 3.16	105	As presented in Chapter 3.16 of the Draft EIS and this Final EIS, the Hawaii Department of Health maintains community noise control standards (HAR §11 46) that also apply to construction noise. These specifications would be adhered to, and a noise permit would be obtained for construction activities performed during standard work hours (Monday through Friday 7:00 a.m. to 6:00 p.m. and Saturday 9:00 a.m. to 6:00 p.m.). Should night work be required (outside of sea turtle nesting/hatching periods and seabird fledgling periods), it would be limited and of short duration at the connection points at the north and south ends of the corridor in order to limit daytime congestion. The distances of this anticipated night work would be far enough away from residences to have no adverse effect.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Malihini Keahi	-	59	In-person verbal testimony	Aloha. I'm Malihini Keahi. I'm from Lahaina all my life. You know, my dad was Moon Keahi. And my father used to help a lot of representatives who were trying to make a change on the west side. And the craziest thing was that every time they wanted to add a road something else was coming. So again, you know, I live in Leali'i. I spoke my piece up there. I think what I'm afraid of more so is the highway. So you take up more land. You open up the highway. And then you infringe on people in Olowalu.(114) Some of them are wanting the changes. But you know what? I think leave Olowalu as peaceful as it is. It doesn't stop traffic to come into Lahaina. Today I had an appointment on the other side. I came back this way. Traffic was backed up on the bypass.· And I think the more road you make the more people come. (114)	114	Ch. 1	10	As described in Chapter 1, Introduction, Purpose and Need, of this Final EIS, the Project's primary purpose is to provide a reliable transportation facility in West Maui and improve Honoapi'ilani Highway's resilience by reducing its vulnerability to coastal hazards. Specifically, the Project is intended to address existing coastal erosion and flooding vulnerabilities as well as future coastal erosion and flooding. The Project does not include land use actions or modifications to the existing zoning that would facilitate additional development in the surrounding area. Regarding the Olowalu Town Master Plan Project, on December 7, 2015, the State Land Use Commission denied the acceptance of the Final EIS and the project was discontinued. There are currently no filed applications or permits to indicate that the Olowalu Town Master Plan Project would be pursued again. In addition, should the Olowalu Town Master Plan Project (or a project of similar scope or nature) be proposed, it would likely be subject to approvals, potentially involving environmental review and associated public engagement requirements.
	-			And with what Lahaina has just already gone through it's, like, this is too much. It's just too much. I think Lahaina, Olowalu needs to be rethink -- I know they were wanting to make a whole village and a whole town. That place is sacred. I think the few people that know about it and the people that have learned about it in this last 20 years is plenty enough. We need to speak -- we need to share the history of Olowalu, not condemn it because we're going to have more people coming in. You know, that area -- it's been sacred for me all my life growing up (115) . Whenever we were gathering with my grandmother there we'd always end up down by Olowalu Pier and we would spend a week or a month, especially when my grandparents were alive, and we'd all gather. Everybody who was from Pu'ukoli'i on this side of the island -- we'd go to Olowalu. That is gone now. Yeah. My babies grew up there. My grandbabies today -- they don't -- they enjoy it there because of the feeling and as we grew up there. But Olowalu is special. And those of you that are there, you're very blessed. And I just feel that this whole highway thing -- and I know progress is progress.	115	Ch 3.7	52	HDOT and the FHWA have worked to maintain an open dialogue with the community and to use this information to minimize disturbance to Aina and to cultural resources found within Ukumehame and Olowalu ahupua'a. The analyses contained within the Draft and Final EIS generally use ahupua'a as a geographic unit for delineation rather than 'ili (a smaller area of land within a ahupua'a); however, in instances where further geographic refinement was warranted (e.g., Chapter 3.7, Cultural Resources) 'ili are discussed.
	-			But, like I said, every time we add a road something else is happening. It gets developed.(114 cont) All the work that Tanya did of exposing our history is going to be covered all over again. Maybe not all the areas, but most of it -- of her hard work, of our past. And that is today that is going on – that we get to know of our past, our history. For our children and our grandchildren and our great-grandchildren -- they'll never see that. It's going to be covered.(115 cont.) And you add one more road -- that's not going to help.	114, 115	Ch.1, Ch. 3.7	10, 52	
	-			You know what? After the fire, traffic was very little. People respected and got only on the bypass through Lahaina and Keawe. And that got all messed up, yes. And then we asked these two, "Why couldn't you do the road Mauka and take it to Honokowai?" We said no more money. But you talk about money. So why don't you work on that part? (116)·	116	Ch. 2	27	As noted in the comment, there is no current funding for work on the bypass north of Lāhainā. The Project was started well before the devastating 2023 wildfire that destroyed Lāhainā and resulted in significant human loss and suffering as well as difficult economic impacts. The Project would generally support the efforts to rebuild Lāhainā by providing a reliable transportation facility in West Maui and improving Honoapi'ilani Highway's resilience by reducing its vulnerability to coastal hazards. Planning for the Project began with pre-Notice of Intent Scoping, where HDOT and FHWA held two early scoping meetings in February 2022. The EIS scoping period was initiated in November 2022. These activities informed HDOT and FHWA's approach to future public engagement and community input was used to hone the Project's Purpose and Need Statement and to understand potential concerns that should be considered in the analyses. At the time of the wildfire, the Draft EIS technical evaluations were largely complete and being reviewed and refined. The goal was to publish the Draft EIS toward the end of 2023. After the wildfire, HDOT and the FHWA reviewed each technical evaluation to acknowledge and identify whether changes in the analyses would be appropriate based on the wildfire's effects. While there was extensive public participation before the wildfire, HDOT and the FHWA understand that the community's focus has been on rebuilding efforts. However, the purpose and need for the Project remain, and the funding associated with the Project was committed prior to the wildfire.
	-			You know, above – So, anyway, I didn't mean to come talk but I had to say something. And I have my family Naho'oikaikas Olowalu and I was really worried where that road was going to change because they're right above the store. (117) And that's why I'm here.	117	Ch. 3.6	47	For clarification, the APE line referenced in the comment is intended to show the extent of the Project's study area of possible project effects on historic architectural and archaeological properties (the APE is not a proposed roadway alignment). In the evaluation of all Draft EIS alternatives for Olowalu, Build Alternative 4 (which is closest to the APE boundary) and Build Alternative 1 were excluded from the Preferred Alternative because these alternatives would have the greatest potential for adverse effects on historic properties (though neither directly affect the Naho'oikaika property).

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Ms. Keele	-	60	In-person verbal testimony	So mahalo to having this in Lahaina. I think that's really helpful. I want to recognize that, Director Sniffen, you've done this a couple times now. So thank you -- coming to the community to have conversations. I'm happy to see so many people from the area that we're discussing because I found out about this meeting because I opened my, like, Lahaina Strong weekly email today. So they happened to have it in there. And so just advertisement wise if there's something better that you guys could do for future engagement because our community is really overwhelmed. And so we need to have a little bit of notice so we can plan around things.				
	-			I do want to acknowledge that in the presentation it looks like someone did realize it since you had these printed because on the boards it does say "a grassy median" and that made me very uncomfortable. So I want to make sure that we are talking about that as a native plant median and not a grassy of some sort. (118)	118	Ch. 3.11	70	An environmental commitment of the Project as specified in Chapter 5 of this Final EIS requires the use of native species for all revegetation and landscaping purposes. Species identified in the project area will be prioritized. Additional consideration will be given to native, fire-resistant vegetation. Turf grass is prohibited for revegetation and landscaping in accordance with the 2011 HDOT Highway Manual for Sustainable Landscape Maintenance.
	-			And then just engagement wise, you know, I'm just kind of wondering, like, how you've done it and how much you've done because this is something that, especially on Maui, we've found is that we just -- there just isn't really engagement. People say there's engagement and, like, yeah, some people go the meetings but, like, it's always the same groups of us that do. And I appreciate the explanation of the preferred versus the alternatives. I think that was really helpful.				
	-			I do think that cultural concerns is very -- it's a very significant conversation for us to have. You know, we know that there's going to be Iwi where we're talking about. And so having a plan for that – because my understanding is, like, the state law, like, doesn't exist about it.· Like, you find Iwi and you stop. And that's, like, the law. So, you know, just being mindful of those kind of things because we know that's going to happen. (119)	119	Ch. 3.6	46	Chapter 3.6 of the Draft EIS and this Final EIS summarizes the extensive survey and research conducted by the Project's archeologists and historians. The results of the analysis to date have allowed for a refinement of the alignment of the Preferred Alternative to avoid and minimize disturbance of identified archeological and architectural historic resources, such as heiaus. Chapter 3.7 of the Draft EIS and this Final EIS provides a contextual history of the cultural resources of the project area. In coordination and continued dialogue with the community, there will be comprehensive testing for historic resources (Archaeological Inventory Survey or AIS) for the Selected Alternative, with testing protocol and mitigation requirements set forth in the Executed Programmatic Agreement as required by the National Historic Preservation Act and the Hawai'i Revised Statutes, Chapter 6E process. Consultation with descendants and other individuals and organizations with a demonstrated interest in the Project (referred to as "consulting parties") is ongoing as part of the Federal Section 106 and Hawaii 6E processes and will continue as the Project moves into final design and construction.
	-			And then to Dave's point, I really liked the comment about the guardrails. (120)	120	Ch. 2	22	Guard rails will be included along both sides of the new highway.
	-			And I also enjoyed the comment about the passing lanes.(121) And I don't know that that's necessarily an option, but I do think that at the very least we should have signs that say, like, pull over to let other cars pass or something because that absolutely happens. And I think encouraging people to drive faster around isn't great.But letting people know, like, "Hey, you're driving too slow -- get out of the way" is, like, very helpful to those in our community who have to commute every day and deal with all these tourists. And I think that's really it. Otherwise, everything's been covered. So mahalo for having this.	121	Ch.1	7	As stated in Chapter 2, Alternatives of the Draft EIS, based on current demand, the proposed highway would be constructed with two lanes but with sufficient right-of-way to accommodate a full four-lanes if and when demand indicates that need and if funding is available. The initial project construction would clear, grade and provide infrastructure (bridges and culverts) and be ready to accommodate four lanes. Should HDOT pursue completion of a four-lane configuration in the future, a supplemental NEPA/HEPA environmental assessment would be undertaken. Based on comments made during the Draft EIS public comment period and at the public hearings, the HDOT will evaluate in the design build process the potential for including a passing lane segment as part of the initial build-out.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Victoria Kaluna-Palafox	-	61	In-person verbal testimony	Aloha. Good evening. My name is Victoria Kaluna-Palafox. I live in Ukumehame. I am and we are Ukumehame restoration wetlands and restoration of Limu projects working in Ukumehame. Also working with Olowalu. We pray that we connect with our ohanas here in Lahaina so that we can continue the growth of Limu to renourish our oceans again and to protect our wetlands. And with that, Ukumehame for many, many years has been very dry. The wetlands has had no life until a couple years ago. If you go to Pohaku Aeko Street there's, like, a culvert they made. Over there it used to be all dry. The only time that wetlands used to fill up is when the rains used to come and a little seepage from the ocean floor. Today in that culvert there's water in there and there's fishes. There is life right where you're thinking of putting that highway. I ask you not to do it. I ask you to go ahead, bring your scientists, and check our 'Aina Ukumehame because it's coming alive again. There is fishes where you wouldn't think there is fishes. There are water pools in Ukumehame where there weren't water pools. (122) It is starting to show us.	122	Ch. 3.10	71	Biologists performed surveys in the area throughout 2023 (Draft EIS Appendix 3.10 as well as additional field surveys conducted in March 2025 (Final EIS Appendix 3.10).While the culvert under Pōhaku ʻAeko Street was not included as part of these surveys (because it would not be affected by the Project), the surveys do acknowledge the local habitats in Ukumehame and names of fish species known to be in the Ukumehame and Olowalu streams were listed. They include ʻOʻopu and Āholehole. The biggest threats affecting fish include habitat degradation resulting from water diversion, stream channelization, dams, pollution, and the introduction of exotic species and parasites. For the Project, no streams will be diverted or channelized, and no in-water work is planned for bridges and stream crossings to avoid and minimize potential impacts on fish and other aquatic species. In coordination with state and federal natural resource agencies, environmental commitments to BMPs will be utilized to protect water resources and the area's native species from construction and operational impacts (see Final EIS Chapter 5). These include using native plants for revegetation which will help with soil retention. Water quality monitoring by trained local scientists will flag if any degradation is occurring so that mitigation can be implemented.
	-			There was one developer -- and the only developer back there -- he tried to help the community by building eight cottages. In order to get their cottages built he covered up a wetland pool and put the eight houses on it. My question to you -- how are you going to run your highway? With a big berm or are you doing dry pipe? If it is dry pipe I am against dry pipe because the wetlands are important for us, especially at this time. We need to start concentrating on growing food for our people.· And this is where it should be Ukumehame Olowalu -- the largest land in Lahaina. Open, barren, good 'Aina for grow food. (123) The other part that I am very concerned about is all the wetland pools. There's a special one that I talked to Tanya and I talked to Pua today. It was always kept within the Kupuna's, Mana', and Mo'olelo. We have not shared that space yet.	123	Ch. 3.9	53	As evaluated in the Draft EIS and this Final EIS, the Project's alternatives were established to avoid and minimize wetland areas and to manage stormwater flow from the new highway with low impact design standards and not hard infrastructure, such as piping storm flows for direct discharge to adjacent waters. As described in Chapter 5 of this Final EIS, the Selected Alternative incorporates many design features that would preserve and not substantially alter water flow from mauka sources towards the ocean. The alignment would be on viaduct over the low lying inundation areas adjacent to the Ukumehame Firing Range and wetlands in the Ukumehame area. Spanning these important ecological features preserves wetlands and wildlife habitat to the greatest extent practicable. Bridges and culverts would allow for continued water flow while crossing the new highway. Based on low impact design standards required by State and federal guidance, stormwater flowing off the new highway pavement would be collected and treated with infiltration basins located in multiple locations along the corridor.
	-			As Olowalu has a cave up in the valley filled with water and that land belonged to the Nahina and Ho'oikaika's, today Peter Martin wants to funnel that water out. Ukumehame is the same. It is a land of food growth. We need to look into that history. The wetlands of Ukumehame starts from the pipe and it comes almost all the way to the river. The reason why I'm saying almost to the river is because the river's water flow comes within that passage so the wetlands could stop at one certain point. Again -- Yeah. Again I will repeat -- many years from the time of the first development that area was all wet. Within the last year or so water has been seeping under the road. Kane has found his way, therefore bringing the fishes back to where they was in time past.(123, cont.) I thank you very much for the time.	123	Ch. 3.9	53	

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Linda Nahina Magallanes	-	62	In-person verbal testimony	Aloha mai kakou. My name is Linda Nahina Magallanes. I'm an original descendant of Olowalu -- my biggest concern. I know a lot of culture is significant in that area.(124)	124	Ch 2	17	As presented in the Draft EIS and this Final EIS, the various alternatives were evaluated based on the full range of technical environmental analyses conducted as well as roadway design considerations. In addition to the loss of monkeypod trees Build Alternative 1 in Olowalu would have resulted in further potentially adverse effects related to the proximity to existing residences and the intersection of Olowalu village center and the existing highway. All the alternatives are approximately the same length, so alignment length alone was not a primary factor in the comparative impact evaluation. As described in the Draft EIS, the Preferred Alternative is based on Build Alternative 1 in Ukumehame and Build Alternative 2 in Olowalu and is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.
				I had asked about cutting down the trees through Olowalu -- the tunnel trees. I was told they cannot. Why? You protect the trees but you're not protecting the cultural significance of Olowalu. Every bit of Olowalu is significant culturally. (124 Cont.) I know that because I'm also from Olowalu with the connection of my ohana Naho'oikaika and Keao. I used to live where the farm is right now that -- by the highway -- that coconut farm and butterfly -- I lived there until we moved into Lahaina.	124	Ch 2	17	
				But my biggest concern is if you put the road up higher what about the heiau on the top? That heiau is still going strong. There's also Pu'u Kilea, which is -- our Kupunas are buried on top. (125) You're going to put one highway through that. You have Awalua, which is the outskirt of Olowalu on the Lahaina side. Then you've got Kapa'i, which is on the Wahikuli side of Olowalu. So also these places need to be named correctly. Not -- Kapa'i is not Olowalu. That's Kapa'i. (125)	125	Ch 2	19, 52	Response 19: In both Ukumehame and Olowalu, Build Alternative 4 was intended to represent the most mauka of alignments (that is, the most separation from the coast and inundation flood zones). The evaluation of this alignment showed that the distance from the coastline resulted in substantially more potential adverse effects on private property and other environmental considerations compared with Build Alternatives 1 and 2. As identified in Chapter 5 of the Draft EIS, the Preferred Alternative was selected based on Build Alternative 1 in Ukumehame and Build Alternative 2 in Olowalu. Build Alternative 4 was not identified as part of the Preferred Alternative, and the Preferred Alternative would not result in potential adverse effects to the referenced heiau. The Preferred Alternative avoids and minimizes effects on existing residences as well as cultural resources and other environmental considerations. The alignment does not create new development opportunities within the project area. Response 52: HDOT and the FHWA have worked to maintain an open dialogue with the community and to use this information to minimize disturbance to Aina and to cultural resources found within Ukumehame and Olowalu ahupua'a. The analyses contained within the Draft and Final EIS generally use ahupua'a as a geographic unit for delineation rather than 'ili (a smaller area of land within a ahupua'a); however, in instances where further geographic refinement was warranted (e.g., Chapter 3.7, Cultural Resources) 'ili are discussed.
				I said this in many meetings. I came to many meetings. I also was on you guys' Zoom meeting and somebody said they was going to get back to me and to today never got back. It really disappoints me because nobody listened because it's all about the road. If you cut the trees down, you got one road there. Use the old cane haul road. What's so hard about that? Instead of going up (124, cont) -- because even on the cane haul there's -- the cane road to the regular road has cemetery on the left. Check West Maui Land EIS and put that together with your EIS. Something will go right. That's all I got to say. I'm kind of angry and I'm sorry by coming out like this. But nobody listening to the people who from here of Maui, of Lahaina, in Olowalu. I'm very upset because nobody listens. They're just doing what they like, put roads where they like, but not listening to the people -- listening to the money. Thank you.	124	Ch. 5	17	As presented in the Draft EIS and this Final EIS, the various alternatives were evaluated based on the full range of technical environmental analyses conducted as well as roadway design considerations. In addition to the loss of monkeypod trees Build Alternative 1 in Olowalu would have resulted in further potentially adverse effects related to the proximity to existing residences and the intersection of Olowalu village center and the existing highway. All the alternatives are approximately the same length, so alignment length alone was not a primary factor in the comparative impact evaluation. As described in the Draft EIS, the Preferred Alternative is based on Build Alternative 1 in Ukumehame and Build Alternative 2 in Olowalu and is considered the best opportunity to achieve the Project's purpose and need while minimizing and avoiding environmental impacts.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Mr. Kaluna Palafox	-	63	In-person verbal testimony	I'm from Ukumehame. We're the first ones that you guys gonna plow through, you know, and come into our kuleana. That's like taking a part of our livelihood. (126) Even through how much you guys coming through, but you still coming through our kuleana. It was two generations. For me hard because now we feel like we are losing out again, you know, the kanaka – always the ones to lose all their -- especially for a generation. You know, how much more the kanaka people got to lose? You know, it's already there. It's already stated. We're impacted. Land Commission awards but they no accept one TMK over that. You know, we become a loser again. You know, we suffering already with what we get.	126	Ch. 1	11	The Project seeks to create a new highway alignment that is less vulnerable to coastal erosion and flooding that has undermined the reliability of the existing highway for decades. HDOT and the FHWA considered a "No Build" Alternative that would leave the highway in place or make other improvements (such as coastal armoring) that could protect the existing road alignment from the ocean. However, these solutions weren't found to fix the problem of the ocean flooding the road. The road needs to be moved mauka to keep ocean waters off the road, and coastal armoring was found to worsen coastal erosion, which would in turn further degrade the Olowalu reef. The Preferred Alternative, as described in the Draft EIS and the Selected Alternative, as presented in this Final EIS—include revisions that are based on public comments about specific elements of the Project. Refinements to the alignment provide a balanced approach that achieves the Project's stated purpose and need combined with the best opportunity to avoid, minimize, or mitigate impacts to the community and the environment. Generally, the No Build Alternative, or fixing the old highway as suggested in the comment, does not address the Project's purpose and need of having a reliable transportation link connecting West Maui and Central Maui. This assessment is based on the existing and predicted levels of coastal erosion and flooding inundation. Any parcels that may be affected by right-of-way requirements for the new highway alignment—including kuleana parcels—are evaluated for the need of full or partial acquisition. Property acquisition would adhere to the appropriate procedures for fair compensation as set forth in the Uniform Relocation Act, as applicable (see Chapter 3.4 of the Final EIS). With regard to wetlands and water bodies, the alignment would be on viaduct over the low lying inundation areas adjacent to the Ukumehame Firing Range and wetlands in the Ukumehame area. Spanning these important ecological features preserves wetlands and wildlife habitat to the greatest extent practicable. Bridges and culverts would allow for continued water flow while crossing the new highway.
	-			*We see all our beaches being destroyed, being used as recreation (127).* Ukumehame is a recreational park. Outsiders come do surf lessons and the instructor is just as White as the person that came off of the plane. You know, I could see with a local, but no. So our land is being used as a recreation. Economy. You can make money. What about the people that already is suffering -- all the kanaka? You got to fight for Lahaina. How is that? My wife -- generations, two generations. How come she got to fight just to stay on our land? Plenty kanaka kawai got to fight for our land. We already fighting for our water so we can make money.	127	Ch 3.5	43	The new alignment of the Honoapi'ilani Highway would be mauka of the existing highway and would not provide direct access to beach areas. The roadway is proposed to be limited access only at intersections, with existing mauka to makai cross-streets. There would be no parking or pull-off areas along the new alignment. Beach access would continue to be available from the existing Honoapi'ilani Highway, which would become a County roadway and is expected to be integrated with the future plans for the Maui County West Maui Greenway. Once under County jurisdiction, the management of parking, access to adjacent beaches, and access to/from the greenway can be integrated into corridor planning.
	-			The hotels, the greedy ones, sucking all up the water. But the people suffer with 20 percent of water. How is that? Even the kanaka -- they get first rights automatic -- first rights no questions asked. They get the right for the water, for the 'Aina. You cannot just come through and think you own and just plow through all our cultural sites or our wetlands or the river and life. (126 cont.) I mean, I'm pure Filipino. My dad came from the Philippines. My mom born here. But my heart is so kanaka. And I cry about all of that because I know all these kanakas out here is suffering. They're suffering. You know, I know it's hard for me. I got to see all this with my own eyes.	126	Ch. 1	11	The Project seeks to create a new highway alignment that is less vulnerable to coastal erosion and flooding that has undermined the reliability of the existing highway for decades. HDOT and the FHWA considered a "No Build" Alternative that would leave the highway in place or make other improvements (such as coastal armoring) that could protect the existing road alignment from the ocean. However, these solutions weren't found to fix the problem of the ocean flooding the road. The road needs to be moved mauka to keep ocean waters off the road, and coastal armoring was found to worsen coastal erosion, which would in turn further degrade the Olowalu reef. The Preferred Alternative, as described in the Draft EIS and the Selected Alternative, as presented in this Final EIS—include revisions that are based on public comments about specific elements of the Project. Refinements to the alignment provide a balanced approach that achieves the Project's stated purpose and need combined with the best opportunity to avoid, minimize, or mitigate impacts to the community and the environment. Generally, the No Build Alternative, or fixing the old highway as suggested in the comment, does not address the Project's purpose and need of having a reliable transportation link connecting West Maui and Central Maui. This assessment is based on the existing and predicted levels of coastal erosion and flooding inundation. Any parcels that may be affected by right-of-way requirements for the new highway alignment—including kuleana parcels—are evaluated for the need of full or partial acquisition. Property acquisition would adhere to the appropriate procedures for fair compensation as set forth in the Uniform Relocation Act, as applicable (see Chapter 3.4 of the Final EIS). With regard to wetlands and water bodies, the alignment would be on viaduct over the low lying inundation areas adjacent to the Ukumehame Firing Range and wetlands in the Ukumehame area. Spanning these important ecological features preserves wetlands and wildlife habitat to the greatest extent practicable. Bridges and culverts would allow for continued water flow while crossing the new highway.
	-			I mean, I'm 66 years old. I watch Maui from when I was born in to today how things look is all messed up. You know, I sorry. But the County and the State -- they making it more kapulu. You come with the machine, plow any kind, don't even -- you, sorry, but half-ass -- kapulu. I'm sorry. But mahalo. I hope they will get to you guys. You know, you guys -- we the first families. You guys coming through -- you know, I'm sorry. I no like you guys come through my property and my -- it's not my property, my kuleana. And my great-great-grandkids behind me -- I'd like them live the same life as me. So fix the old highway. You guys will save a lot more money by just fixing it. (126 cont.) Mahalo.	126	Ch. 1	11	The Project seeks to create a new highway alignment that is less vulnerable to coastal erosion and flooding that has undermined the reliability of the existing highway for decades. HDOT and the FHWA considered a "No Build" Alternative that would leave the highway in place or make other improvements (such as coastal armoring) that could protect the existing road alignment from the ocean. However, these solutions weren't found to fix the problem of the ocean flooding the road. The road needs to be moved mauka to keep ocean waters off the road, and coastal armoring was found to worsen coastal erosion, which would in turn further degrade the Olowalu reef. The Preferred Alternative, as described in the Draft EIS and the Selected Alternative, as presented in this Final EIS—include revisions that are based on public comments about specific elements of the Project. Refinements to the alignment provide a balanced approach that achieves the Project's stated purpose and need combined with the best opportunity to avoid, minimize, or mitigate impacts to the community and the environment. Generally, the No Build Alternative, or fixing the old highway as suggested in the comment, does not address the Project's purpose and need of having a reliable transportation link connecting West Maui and Central Maui. This assessment is based on the existing and predicted levels of coastal erosion and flooding inundation. Any parcels that may be affected by right-of-way requirements for the new highway alignment—including kuleana parcels—are evaluated for the need of full or partial acquisition. Property acquisition would adhere to the appropriate procedures for fair compensation as set forth in the Uniform Relocation Act, as applicable (see Chapter 3.4 of the Final EIS). With regard to wetlands and water bodies, the alignment would be on viaduct over the low lying inundation areas adjacent to the Ukumehame Firing Range and wetlands in the Ukumehame area. Spanning these important ecological features preserves wetlands and wildlife habitat to the greatest extent practicable. Bridges and culverts would allow for continued water flow while crossing the new highway.

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Ms. Felice	-	64	In-person verbal testimony	You kind of just, I guess, nipped it in the bud by saying that you're not going to build a highway up north because we don't have the funding. Right? But we need another way out of Lahaina. If you were here during the fire you would understand. (128)	128	Ch. 2	27	As noted in the comment, there is no current funding for work on the bypass north of Lāhainā. The Project was started well before the devastating 2023 wildfire that destroyed Lāhainā and resulted in significant human loss and suffering as well as difficult economic impacts. The Project would generally support the efforts to rebuild Lāhainā by providing a reliable transportation facility in West Maui and improving Honoapi'ilani Highway's resilience by reducing its vulnerability to coastal hazards. Planning for the Project began with pre-Notice of Intent Scoping, where HDOT and FHWA held two early scoping meetings in February 2022. The EIS scoping period was initiated in November 2022. These activities informed HDOT and FHWA's approach to future public engagement and community input was used to hone the Project's Purpose and Need Statement and to understand potential concerns that should be considered in the analyses. At the time of the wildfire, the Draft EIS technical evaluations were largely complete and being reviewed and refined. The goal was to publish the Draft EIS toward the end of 2023. After the wildfire, HDOT and the FHWA reviewed each technical evaluation to acknowledge and identify whether changes in the analyses would be appropriate based on the wildfire's effects. While there was extensive public participation before the wildfire, HDOT and the FHWA understand that the community's focus has been on rebuilding efforts. However, the purpose and need for the Project remain, and the funding associated with the Project was committed prior to the wildfire.
Viktoriy A Sirova	US Department of the Interior	65	Email	The U.S. Department of the Interior (Department), as required by the Department of Transportation Act of 1966 (49 U.S.C. §303 and 23 U.S.C. §138), has reviewed the December 2024 DRAFT Section 4(f) Evaluation for Honoapi'ilani Highway Improvements Project West Maui: Ukumehame to Launiupoko. The Hawai'i Department of Transportation (HDOT) proposes to build a new six-mile alignment of the Honoapi'ilani Highway to provide a reliable transportation facility in West Maui and reduce the highway's vulnerability to coastal hazards. Several areas with archaeological resources in Olowalu and Ukumehame were evaluated for potential impacts by one or more Build Alternatives. A draft Programmatic Agreement between HDOT and the Hawai'i State Historic Preservation Division includes protocols to avoid, minimize, or mitigate adverse effects to archaeological historic properties and burials. The 4(f) evaluation concludes that the Build Alternatives will not have direct, temporary, or constructive use of 4(f) resources within the Olowalu Sugar Plantation Historic District or on individually eligible and contributing resources in Olowalu. In Ukumehame, there are no eligible architectural historic properties - i.e., no 4(f) protected historic resources. The Department, through the National Park Service (NPS), concurs with a de minimis finding, that the project will have no adverse effects on any Section 4(f) properties within the project area. (129) If you have specific questions related to our comments, please contact Danette Woo Nolan at Danette_Woo@nps.gov. For all other questions, please contact me at Viktoriya_Sirova@ios.doi.gov.	129	Ch 4	109	Thank you for your comment and your interest in the Project.
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Marianne Rossio, P.E.	Hawaii State Department of Health, Clean Air Branch	66	Email	All project activities shall comply with Hawaii Administrative Rules (HAR), Chapter 11-59 and 11-60.1. (130) If your proposed project: *Requires an Air Pollution Control Permit* You must obtain an air pollution control permit from the Clean Air Branch (130) and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch. Permit application forms can be found here: https://health.hawaii.gov/cab/permit-application- forms/ *Has the potential to generate fugitive dust* You must reasonably control the generation of all airborne, visible fugitive dust (130 cont.). Note that construction activities that occur near existing residences, businesses, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does not require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems. Construction activities must comply with the provisions of Hawaii Administrative Rules, §11- 60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, it is strongly recommended that buffer zones be established, wherever possible, in order to alleviate potential dust concerns. You must provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following: Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact; Providing an adequate water source at the site prior to start-up of construction activities; Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase; Minimizing airborne, visible fugitive dust from shoulders and access roads; Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and Controlling airborne, visible fugitive dust from debris being hauled away from the project site. If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch. Please also see fugitive dust fact sheet at: https://health.hawaii.gov/cab/files/2024/02/Hawaii-Fugitive-Dust-Fact-Sheet-February-2024.pdf.	130	Ch 3.15	99	As noted in this Final EIS (Chapter 5) project construction would be required to employ BMPs to control fugitive dust and any other air pollution control permit requirements would be obtained, as necessary.
-				Includes construction, demolition, or renovation activities that involve potential asbestos and lead containing materials please contact the Indoor and Radiological Health Branch (131) at (808) 586-4700 or visit: https://health.hawaii.gov/irhb/	131	Ch 3.15	100	The project would not be demolishing or renovating structures that might have asbestos and lead containing materials.
-				Increases the population and potential number of vehicles in an area (132) The creation of apartment buildings, complexes, and residential communities may increase the overall population in an area. Increasing the population in an area may inadvertently lead to more air pollution via vehicle exhaust. Vehicle exhaust releases pollutants in the air that can negatively impact human health and air quality, including lung irritants, carcinogens, and greenhouse gases. Ensure that drivers keep vehicle idling times to three (3) minutes or less. Consider and incorporate support for alternative transportation options such as bike racks and/or electric vehicle charging stations where possible. If you have any questions, please contact the Clean Air Branch at (808) 586-4200 or at cab@doh.hawaii.gov.	132	Ch 3.15	101	The project does not have a development or land use component and is not expected to induce development so there is no anticipated incremental increase in population or vehicular traffic. The Selected Alternative will incorporate bicycle and pedestrian facilities and is fully compatible with the potential future implementation of the West Maui Greenway.
-				The Department of Health (DOH), Clean Air Branch (CAB), will no longer be responding directly to requests for comments on the following documents (including pre-consultation, early consultation, preparation notice, draft, final, addendums, and/or supplements): Environmental Impact Statements (EIS) Environmental Assessments (EA) Anticipated Finding of No Environmental Significant Impacts (AFONSI) Conservation District Use Applications (CDUA) Special Management Area Permits (SMAP) For agencies or project owners requiring DOH-CAB comments on one or more of these documents, please utilize the DOH-CAB Standard Comments below regarding your project's responsibilities to maintain air quality and any necessary permitting. DOH-CAB Standard Comments are also available on the DOH-CAB website located at: https://health.hawaii.gov/cab/files/2024/07/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-July_2024.pdf. If you have any questions, please the Clean Air Branch at (808) 586-4200.				

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Kathleen Rooney, Ulupono Initiative	-	67	Webform	Ulupono Initiative appreciates the Hawaii Department of Transportation's work on this realignment project and generally supports the chosen alternative; we acknowledge the significant amount of care and time spent on this project to bring it to this point. We also appreciate the department's transparent approach on the website, particularly the explicit connection to the Olowalu project, as well as discussions on Maui County's role in the use of the old road. While acknowledging these efforts, we recommend — similar to our past comments — that consideration be made to strengthening the multimodal and active transportation components within the project framework. This could include any number of more robust commitments, including: • Consider modifying the current cross-section design to be more amenable to active transportation elements, such as a moving the roads more inward and including a multi-use path. • Strengthen financial commitments to the active transportation infrastructure. While the West Maui Greenway represents a promising initiative, securing dedicated funding would ensure its implementation. Similar funding considerations could benefit the Olowalu project, creating a comprehensive active transportation network. (133) This list is not exhaustive, and Ulupono stands ready to collaborate on the exploration of these and other options with Hawaii Department of Transportation. Mahalo, Kathleen Rooney Director, Transportation Policy and Programs Ulupono Initiative	133	Ch 3.14	96	Based on this and several other comments, the Selected Alternative as presented in this Final EIS will include a separated shared-use pathway along the makai edge of the new highway right-of-way and will include signal-controlled bicycle and pedestrian crossings at Luawai Street in Olowalu and Ehehene Street in Ukumehame. This addition to the Selected Alternative is included in the revised cost estimates for the Project as summarized in Chapter 5, Selected Alternative. The West Maui Greenway is an independent project outside the jurisdiction of HDOT. Funding for the West Maui Greenway Plan is outside of the scope of the Project and this Final EIS.
Jeremy Morgan	U.S. Army Corps of Engineers	68	Email	Thank you for allowing the U.S. Army Corps of Engineers the opportunity to provide comments on the Honoapi'ilani Highway Improvements Project draft EIS. When fill quantities and impact areas within aquatic resources are finalized, please submit a Corps permit application to CEPOH-RO@usace.army.mil, so we can begin the review process for discharges of fill under Section 404 of the Clean Water Act (134).	134	Ch. 3.9	67	Permitting will occur in the next phase of the Project, after the Final EIS/ROD is finalized.

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Brian J. Neilson	Hawaii Department of Land and Natural Resources - Division of Aquatic Resources	69	Email	The project will cross two major streams—Ukumehame and Olowalu—but the Draft Environmental Impact Statement (EIS) does not adequately assess the potential impacts of the highway relocation on these streams. Both streams are home to endemic Hawaiian gobies, including the IUCN-listed Sicyopterus stimpsoni, and snails, which have been observed during the CWRM/DAR stream monitoring. (135) As these species are amphidromous, they rely on healthy and continuous stream habitats for their life cycles. Therefore, we recommend that a more detailed analysis of impacts to the stream habitats be included in this EIS. (135)	135	Ch. 3.10	60	As presented in Chapter 3.9 of the Draft EIS and this Final EIS, the Project would be required to provide a bridge spanning the Olowalu and Ukumehame streams, and design standards will be required that prohibit any bridge structures from being within the water course and outside the mean high water level. Coordinating with State and federal agencies, environmental commitments will include construction best management practices and permanent low impact stormwater treatment. Further, the Project's pre-construction, construction, and completion will include water quality and sedimentation monitoring (including in-stream and near shore locations). Overall, no adverse effects on aquatic resources are expected.
				Additionally, the EIS does not clearly specify the type of stream crossing to be used. The impact on water flow and habitat connectivity will differ significantly depending on whether a culvert, bridge, or viaduct is employed. It is important to note that culverts, overtime, can develop undercuts and erosion, which can obstruct the migration of stream species and disrupt habitat continuity. These potential issues should be avoided. There are also no clearly defined Best Management Practices (BMPs) for stream protection during construction. (136)	136	Ch. 3.10	61	The DLNR – Division of Aquatic Resources is a Participating Agency and their input helped guide implementation of best practices to be required for the Project. Full span bridges would be used for the two major perennial streams (Olowalu and Ukumehame Streams) and there is no in-water work planned for the Project at these locations since the bridge embankments would be outside the Ordinary High-Water Mark. Therefore, the Project would not affect species within the Ukumehame and Olowalu streams. Table 3.10-12 of the Draft EIS Chapter 3.10, Flora and Fauna, identifies Avoidance and Minimization Measures that would be implemented as part of the Project. The USFWS has also prepared a Biological Opinion (see Appendix 3.10) with additional commitments identified. As described in Chapter 2, Alternatives and Chapter 5, Selected Alternative, the ultimate determination of culvert and bridge specifications for all crossings in addition to the two perennial streams, or the use of viaducts to span larger areas, is based on identification of the Selected Alternative, the length of the span required, environmental effects, constructability, and cost. These would be finalized during the development of final construction documents as part of the design-build process.
				The report identifies Alternative 2 as the preferred route for Olowalu and Alternative 1 for Ukumehame. However, in Table S-3, a new column labeled "Preferred Alternative" appears, which the score does not seem to align with Ukumehame's Alternative 1. Figure S-6 depicts the preferred alternative route, but it labels it as U-1 and 0-2, making it difficult to clearly distinguish the modified section. According to Table S-3, the preferred alternative is intended to reduce impacts to the wetland, and we would like to see a clearer depiction of how this route has been modified from Alternative 1 on the map. Furthermore, it would be appreciated if wetland and other waterbodies are delineated in the map to assess the impact to the area more accurately. (137)	137	3.9	63	As described in Chapter 5 of the Draft EIS, Alternative 1 was modified in the area where the alignment would connect with the existing highway, shifting to a more makai alignment. The modifications result in the alignment crossing the sediment basin rather than going mauka of the basin. Shifting Alternative 1 further makai in the vicinity of the basin and firing range allows for the avoidance of critical archaeological and cultural sites and reduces impacts to the firing range. The Selected Alternative does reduce impacts to wetland areas by elevating the alignment on a viaduct. The viaduct would cross over the wetland and other water features, reducing impacts to the greatest extent practicable when compared with a roadway on fill. There is no reduction in wetland area crossed by the viaduct (the discrepancy was a GIS layer error and has been corrected as part of this Final EIS).
				Although 0-3/4 and U-4 did not achieve the highest overall score, from an environmental perspective, these alternatives perform well by minimizing impacts to the wetland and preserving the vulnerable lower stream reach habitat. This habitat is crucial for two of our endemic goby species, Eleotris sandwicensis and Stenogobius hawaiiensis, which are unable to migrate to the upper reaches. (138)	138	3.9	64	As noted in the comment, there were instances where the mauka alternatives provided better environmental outcomes. However, on the balance of fulfilling purpose and need and minimizing adverse effects overall, the mauka alternatives were not identified for the Preferred Alternative. Generally, the mauka alternatives resulted in more adverse effects on a range of environmental factors including cultural resources, archaeology, and impacts on the community (such as noise, visual quality, and property acquisition). The potential adverse effects on water and aquatic biota resources would be avoided or minimized based on bridge designs crossing the perennial streams to fully stay out of surface waters and mean high water levels. Project construction would adhere to the HDOT Standard Specifications for Road and Bridge Construction (Section 209) Temporary Water Pollution, Dust, and Erosion Control. Construction BMPs that have been either preapproved or coordinated with regulatory agencies, which are included in an integrated storm water management approach. A "Summary of Clear Water Diversion and Isolation BMPs for Use in the State of Hawai'i," would be utilized to minimize the potential for water quality impacts to the streams. Additionally, the HDOT Construction Best Management Practices Field Manual (October 2021) would be used for land-based BMPs. Structures crossing streams would be designed to preserve water flow and the biological processes of the fauna living in them. Hardening the stream crossings would be avoided to the extent practicable.
				Additionally, the sea level rise simulation indicates that certain sections of the preferred U1 route will be adjacent to or within the sea level rise exposure area, potentially increasing the risk of coastal hardening and erosion in the future. (139)	139	Ch. 3.13	89	To avoid the potential requirement for coastal hardening, the Selected Alternative would be placed on a viaduct above the inundation zone. Other than the piers and columns with a small footprint in these areas (and included in the modeling of potential effects), there would be open flow of water below the viaduct and no additional hardening would be required.

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Dina U. Lau	Hawaii DLNR - Engineering Division	70	Email	The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards. The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). (140) If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below: Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098. Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327. Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139. Kauai: County of Kauai, Department of Public Works (808) 241-4849.	140	Ch. 3.11	88	These requirements are reflected in the initial analyses for the draft floodplain assessment presented in the Draft EIS and there has been no change of condition identified in this Final EIS for the Selected Alternative.
Ciara W.K. Kahahane	Hawaii DLNR - Commission on Water Resource Management	71	Email	We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. (141) Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/	141	Ch. 3.9	65	Based on coordination with state and federal resource agencies, a comprehensive array of stormwater BMPs have been incorporated into the environmental commitments associated with the Project. These BMPs could include detention ponds to promote infiltration and treatment of discharge generated on-site using industry standard low-impact development practices, such as vegetated swales, vegetated buffers, and bioswales as appropriate (including use of the median, where applicable). Permanent BMPs would be designed to treat stormwater generated by the impervious area of the new roadway as it collects at natural low points along the roadway as defined by the final roadway profile. These set asides are conservatively sized for a maximum potential area of disturbance and the final locations and size of the infrastructure may vary depending on the treatment strategies as identified through final design as part of the design-build process, which is assumed to be fully within the right-of-way analyzed as part of this environmental review. HDOT has a comprehensive approach to the management of stormwater runoff associated with its highways as documented in HDOT's Storm Water Post-Construction BMPs Manual, as amended in February 2022. This manual outlines HDOT's policy to prioritize the utilization of low-impact development practices to address polluted runoff from highway surfaces. Additional BMPs included in An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawai'i, would be utilized to minimize the potential for water quality impacts to the streams. Additionally, the HDOT Construction Best Management Practices Field Manual (October 2021) would be used for land-based BMPs.
				There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality. (142)	142	Ch. 3.9	66	Water quality monitoring would be performed in accordance with a Clean Water Act Section 401 Water Quality Certification that would be sought from the Hawai'i Department of Health (HDOH) Clean Water Branch in a future phase of the Project. The HDOH Clean Water Branch issues this certificate and is most frequently required in tandem with a Section 404 permit request. To address permanent and temporary discharges associated with individual projects, the HDOH Clean Water Branch may issue a set of requirements that outline water quality protection measures that must be taken. Additional requirements, as set forth in a National Pollutant Discharge Elimination System General Permit to be sought in a future phase of the Project, would be adhered to including monitoring and inspection of erosion and sediment controls and pollution prevention practices throughout the entire construction process.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Michael Cain	Hawaii DLNR - Office of Conservation and Coastal Lands	72	Email	The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) is responding the request for comments on the DEIS for the proposed Honoapi'ilani Highway Improvements. The OCCL regulates land uses in the Conservation District. The preferred alternative as presented in the DEIS moves the existing highway out of the Conservation District and away from coastal hazards and sea level rise. According to the plans as presented in the DEIS, the intent of DOT is to leave the existing road and shoreline hardening structures in place, and to transfer ownership and maintenance responsibilities to Maui County to become a local access road. OCCL would like to see an assessment of the cost and long-term impact to the shoreline of removal of the existing road and all affiliated protective structures. (143) Given the history and exposure of portions of the existing road to high waves, high tides and sea level rise, ongoing hardening and continual maintenance operations in the Conservation District may be required to maintain the road in service.	143	Ch. 1	13	There are no known plans that would suggest the existing road, or its affiliated protective structures would be removed in their entirety in the future and such conditions are not proposed as part of the Project. Accordingly, an assessment of the cost and long-term impact to the shoreline of removal of the existing road and all affiliated protective structures would be outside the purview of this environmental review. The existing road would continue to provide important local access to homes, businesses, beach areas and parks so it is not anticipated to be removed in its entirety. The ability to plan for the future of the existing roadway to serve a new public use of local access and providing right-of-way to implement the West Maui Greenway but without the burden of ensuring the ability to carry more than 20,000 vehicles per day will enable the roadway to be managed with more flexibility in accommodating less shoreline hardening or other measures. The Draft EIS indicated that The Nature Conservancy is currently evaluating such opportunities along the old highway. The Draft EIS and this Final EIS indicate that once jurisdiction is transferred, there may be conditions in the future where the old highway is not a continuous link throughout the corridor.
				Portions of the old road are in the Limited Subzone of the Conservation District. Per HAR §15-5-12, the objective of the Limited Subzone is to "limit uses where natural conditions suggest constraints on human activities". The natural conditions at the location of the existing highway have necessitated the improvement plan and realignment of the road away from coastal hazards and sea level rise. As identified in the DEIS, approximately four of the six miles of highway proposed for relocation are in the sea level rise exposure area (SLR-XA) at a predicted 3.2ft of sea level rise. The DEIS acknowledges that continued use of the highway at its existing location would require ongoing maintenance work and hardening to achieve short-term fixes to the chronic impacts of coastal hazards. Footnote 5 on page 2-12 of the DEIS states the following: "As part of the relinquishment process, HDOT and the FHWA must concur that the land is not needed for federal-aid Highway purposes in the foreseeable future, that the new roadway segment and its traffic operations would not be adversely affected by relinquishments, and that the lands are not suitable to restore, preserve, or improve the scenic beauty of the new roadway." The lands which are currently occupied by the existing highway are suitable for restoration. Naturalization of the shoreline would improve public access, return public trust land to the public, and benefit reef health at the Olowalu reef by enabling the land to naturally filter freshwater runoff. Restoration may provide a more substantial storm and wave buffer for the areas of the realigned highway which will remain in the SLR-XA. Finally, the scenic beauty of the realigned road will be improved if the existing road is removed and restored to a natural beach profile. (144) Please contact Amy Wirts, University of Hawaii Sea Grant Extension Agent and OCCL Coastal Lands Program Coordinator at (808) 587-0376 or by email atAmy.E.Wirts@hawaii.gov, should you have any questions regarding this matter.	144	Ch. 1	14	The relinquishment of the existing highway would not adversely affect the new roadway segment. The existing highway would continue to provide important local access to homes, businesses, beach areas and parks so it is not anticipated to be removed in its entirety. Once the Project is constructed and operational, the existing highway would not be the primary transportation link between West Maui and Central Maui, and the volume of traffic on the roadway would be substantially reduced. The reduction in traffic volume would allow the County to pursue multiple uses, such as the Maui Greenway, and consider non-hardening measures that are more conducive to naturalizing the shoreline. The Draft EIS and this Final EIS indicate that The Nature Conservancy is currently evaluating such opportunities along the old highway, and that once jurisdiction is transferred, there may be conditions in the future where the old highway is not a continuous link throughout the corridor.
Russell Y. Tsuji	Hawaii DLNR - Land Division Maui District	73	Email	We have no comments.				
Kathleen Rooney	Ulupono Initiative	74	Email (Duplicate Submission - Same as Submission 67)	Ulupono Initiative appreciates the Hawaii Department of Transportation's work on this realignment project and generally supports the chosen alternative; we acknowledge the significant amount of care and time spent on this project to bring it to this point. We also appreciate the department's transparent approach on the website, particularly the explicit connection to the Olowalu project, as well as discussions on Maui County's role in the use of the old road. While acknowledging these efforts, we recommend — similar to our past comments — that consideration be made to strengthening the multimodal and active transportation components within the project framework. This could include any number of more robust commitments, including: • Consider modifying the current cross-section design to be more amenable to active transportation elements, such as a moving the roads more inward and including a multi-use path. • Strengthen financial commitments to the active transportation infrastructure. While the West Maui Greenway represents a promising initiative, securing dedicated funding would ensure its implementation. Similar funding considerations could benefit the Olowalu project, creating a comprehensive active transportation network. (145) This list is not exhaustive, and Ulupono stands ready to collaborate on the exploration of these and other options with Hawaii Department of Transportation. Mahalo, Kathleen Rooney Director, Transportation Policy and Programs Ulupono Initiative	145	Ch. 3.14	96	Based on this and several other comments, the Selected Alternative as presented in this Final EIS will include a separated shared-use pathway along the makai edge of the new highway right-of-way and will include signal-controlled bicycle and pedestrian crossings at Luawai Street in Olowalu and Ehehene Street in Ukumehame. This addition to the Selected Alternative is included in the revised cost estimates for the Project as summarized in Chapter 5, Selected Alternative. The West Maui Greenway is an independent project outside the jurisdiction of HDOT. Funding for the West Maui Greenway Plan is outside of the scope of the Project and this Final EIS.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Julie Durham	-	75	Email	Aloha, I am writing to express my support for the proposed 6.5-mile mauka relocation of the Honoapi‘ilani Highway, in conjunction with the Maui Greenway Project . Before moving to the islands in 2018, I had lived in two towns/cities (Boulder, CO and Melbourne, Australia) with amazing greenway infrastructure, and had travelled to several others (Austin, TX, Copenhagen, DEN, Sydney, AUS) I saw the benefits that the greenways brought to the communities where they were located. (146) They were heavily utilized for commuting and exercise, but also created environmental enhancement and protection. The greenways created natural buffers and green spaces and reduced congestion, but also created a tighter knit sense of community and a peaceful environment for nearby home owners. My dream is that Maui could become another model community which demonstrates the positive impacts of greenspace and greenways, and this is the perfect opportunity to begin making this happen. I feel like it could be a key component to recreating a sense of renewal on the West Side while also creating a sense of newness and hope in the community and island at large. Further, this is a critical realignment that will safeguard a vital transportation corridor that serves as a lifeline for West Maui residents, workers, and visitors, addressing the escalating risks posed by rising sea levels and climate change. As we work toward a more resilient future, this project is a pivotal step in West Maui's recovery, resilience, and sustainability.	146	Ch.3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				I respectfully urge the Hawai**‘i Department of Transportation (HDOT) to prioritize the following key elements within this** project: 1. Utilization of the Old Highway 30 for West Maui Greenway Segments 6 and 7. (146 cont.) The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path. Repurposing this scenic corridor as a multi-use trail is a cost-effective solution that supports safe, non-motorized transportation and recreation. This approach would facilitate the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities. 2. Alignment with Climate and Community Goals. Incorporating the WMG within the realignment project would align with Maui's commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement. A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness. 3. Community-Driven Design for Long-Term Benefits. By transforming the former highway into a recreational and commuting pathway, we can create a lasting community asset that bolsters economic recovery, and public health. A dedicated bike and pedestrian trail would provide safe, scenic access to key cultural and natural landmarks, fostering community pride and environmental stewardship. In summary, while I support the current realignment effort, I respectfully request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. By repurposing this space for non-motorized transportation, we can build a legacy of sustainable infrastructure that meets the needs of future generations and supports West Maui's long-term recovery and growth. Thank you for the opportunity to provide testimony. Mahalo nui loa for your consideration. Juile Durham	146	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
Dr. Marion Ceruti	-	76	Email	Aloha Mr. Tatsuguchi, Mahalo for the opportunity to comment on the EIS for the proposed road project. In general, the idea is good but care should be taken to provide sufficient exits and roads in the makai direction for beach access, to include better parking, particularly at the Ukumehame beach park, on the mauka side of the existing road, (147) if possible.	147	Ch. 3.5	43	The new alignment of the Honoapi‘ilani Highway would be mauka of the existing highway and would not provide direct access to beach areas. The roadway is proposed to be limited access only at intersections, with existing mauka to makai cross-streets. There would be no parking or pull-off areas along the new alignment. Beach access would continue to be available from the existing Honoapi‘ilani Highway, which would become a County roadway and is expected to be integrated with the future plans for the Maui County West Maui Greenway. Once under County jurisdiction, the management of parking, access to adjacent beaches, and access to/from the greenway can be integrated into corridor planning.
				Moreover, more and better parking is needed at the Ukumehame Firing Range to keep users from having to park their cars in the mud puddles. This is a great opportunity to upgrade the parking at Papalaua to do something about the drainage problem that has plagued the area for years. (148)	148	Ch. 3.5	41	Under the Preferred Alternative, the viaduct construction would be makai of the firing range and its parking lots and therefore the Project does not include construction or proposed improvements to the existing parking lots. Similarly, the Preferred Alternative would not involve construction or permanent physical disturbance to Pāpalaua Wayside Park, as evaluated in Chapter 3.5, "Parklands and Recreational Facilities/Beach Access," of the Draft EIS and this Final EIS.
				It might be necessary to relocate the nenes in the area temporarily, for their safety. (149) E Hana Kakou, Dr. Marion Ceruti, West Maui resident	149	Ch. 3.10	72	The Final EIS incorporates a range of environmental commitments (see Chapter 5) that would be required to protect the nēnē during construction. These include but are not limited to high visibility signs to alert drivers to their presence, training for all on-site staff to recognize and protect nēnē, and protocol on what to do if nēnē or their nests are observed.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Roy Ikeda	Hawaii Department of Education	77	Email	Dear Mr. Tatsuguchi, Thank you for your email dated January 6, 2025. Based on the information provided and despite the Lahaina Bypass Highway serving as an alternate route for Honoapiilani Highway, the Hawaii State Department of Education (Department) is concerned about commute times and traffic patterns for its students, parents, and staff as there are many that have been displaced to different parts of the island due to the West Maui Wildfires. With the uncertainty that still lies ahead, the Department requests that your staff and consultants meet with the administrators of Lahainaluna High, Lahaina Intermediate, and Nahienaena Elementary Schools to present traffic impacts leading to and from each of these campuses and specific timelines associated with the project. (150) Should you have any questions, please contact Cori China, of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us. We appreciate the opportunity to comment. Sincerely, Roy Ikeda Interim Public Works Manager Planning Section	150	Ch. 3.14	97	HDOT understands the concerns related to commute times and traffic patterns around one of West Maui's most vital centers for community and educational purposes. HDOT will coordinate a meeting with the referenced parties to address uncertainties that the Hawaii Department of Education has about the Project's effect on traffic. There are no changes at these school sites as a result of the Project. As established in the Final EIS, the Project would not increase traffic and would decrease travel delays since current disrupters such as flooding and emergency roadway storm repairs would be reduced. During project construction, the existing highway would remain open and operational because the Selected Alternative is not on the existing alignment.
Dennis R. Eyler	-	78	Email	Aloha, I was able to attend the first four of the public presentation of the DEIS for this project on January 23. I have filled out the form that was handed out and I have attached a copy to this email. My interest in this project is based on several things. 1. My wife and I have been regular visitors to Maui since the 1990's. In 2012, after I retired, we bought a residence here and since then, we spend several months of the year on the island. 2. We were shocked and saddened at what happened to Lahaina as a result of the fires. We know several people who lost their homes. 3. I would like to help in the island's recovery. 4. I spent my career as a traffic and highway preliminary design engineer, and I worked as an employee for 2 state transportation departments and then as a consultant for government agencies for 35 years and worked on highway projects in 6 different states. I have attached a copy of my resume. 5. Since the 1990's I have been involved with the development and implementation of projects meeting the design criteria of the Super-2 highway concept and also in the development and implementation of reduced conflict intersections (RCIs). The RCI concept utilizes the proven safety benefits of certain roundabout features but also strives to minimize the added travel time to the major roadway when it intersects with low volume minor roadways. I have attached a few of the technical papers I have presented on these topics. The most recent was at the University of Minnesota's Center for Transportation Studies annual meeting in 2023. It was on the subject of the Super-2 and in that presentation, I referenced the completed section of the Lahaina Bypass on pages 14 and 35. 6. I am also very impressed by the high daily traffic volumes carried by the existing facility. Of course, I also realize that the flows are fairly balanced directionally and that there are no high-volume crossing roadways due to the roadway following the coastline. 7. In viewing the various materials of this projects DEIS, I quickly concluded that the project as a whole is badly needed. The environmental issues are many and I certainly have no problem with the preferred alignment and its proposed limited access 8. I do have some questions about the geometry that is proposed for those limited access intersections. I also realize that the figures in the DEIS are conceptual and not final. A. The use of left side acceleration lanes without sufficient length to allow entering traffic to get up to speed and the requiring those vehicles to merge right. In my experience left side merges and lane drops have proven to have higher crash rates. Having those entering left turns sit in the center of the roadway without any physical, lateral buffering space from traffic passing on both sides at higher speeds, would seem to be uncomfortable for the drivers and may result in sideswipe crashes. However, since there are many existing locations with left side merges on Maui, my concerns would be greatly lessened if the crash data shows that they perform safely on Maui. (151) 9. The Reduced Conflict Intersection (RCI) design concept eliminates those problems and provides the following benefits. All conflict points involve traffic headed in on direction conflicting with another single traffic movement. At all conflict points the "threat" or priority traffic movement is always approaching from the left or from ahead, never from the right. Since drivers sit on the left sides of their vehicles, this provides good visibility when selecting a gap to enter or cross traffic. No left turns are required into higher speed, higher volume traffic flows. Those features provide safety advantages similar to roundabouts. In addition, RCIs provide two stage crossings of the heavy, high-speed traffic movements and two stage left turns onto the major roadways for any length vehicle. Vehicles of any length are not required to cross both directions of the major roadway while requiring a gap in both directions. (151 cont.)	151	Ch. 3.14	94	The preliminary alignment design has been based on state and federal design standards and reflects the limitations of right-of-way availability, as well as constraints related to sensitive cultural resources and other environmental considerations. For example, innovative reduced conflict intersection concepts noted in the comment would require additional right-of-way acquisition, including areas potentially containing sensitive cultural resources or other environmental concerns and as a result, would be difficult to implement as part of the Project or result in potentially adverse impacts.
					151	Ch. 3.14	94	

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Dennis R. Eyler (continued)	-	78	Email	10. The Minnesota DOT recently announced that on their rural divided highways, they will no longer construct full movement intersections without traffic signals or roundabouts (151 cont.) being provided on day 1. Instead, they will use J-turns or Restricted Crossover U-turns (RCUTS), both of those designs meet the criteria of the RCI. Here is a picture of a MnDOT J-turn for an intersection on a divided highway. Traffic entering from the minor road desiring to cross or turn or turn left, waits for a gap in traffic approaching from the left and then crosses the through lanes and enters the turn lane for the downstream U-turn. The turn lane length for the U-turn is based on speed and storage needs. At the U-turn intersection, a pavement "loon" or widening is provided to accommodate the turning path of the design vehicle making that U-turn. There are other possible designs based on speeds and major roadway traffic volumes. There have been RCUT intersections built on high volume, high-speed roadways were traffic on the minor street turns right, merges, then weaves across to a downstream U-turn Lane. The distances needed for that weave are typically greater than 1700 feet. A J-turn on a high-volume, two-lane roadway would probably not need to use a design where entering traffic gets up to speed, merges, then exits, and slows to make the U-turn. With only one through lane, a gap in the traffic is likely to arrive due to a slow vehicle and the minor roadway vehicle desiring to cross or make a left onto the major roadway can easily get to the U-turn Lane. Here is a typical sign used on the minor roadway approaches. Here's an example of a full RCUT intersection. It's located at US-212 and MN-284 in Cologne, MN. This type of intersection is being used in Minnesota, Wisconsin, Maryland, North Carolina (they call them Super Streets) and Texas. Here is a list of the attachments. 1. DEIS comment form. 2. My resume. 3. The Super-2 presentation at the U of M CTS conference in 2023. 4. Alternative Intersection Designs Wis ACEC-2009. 5. Sketches of possible Reduced Conflict Intersection designs for use of a "Super-2" roadway along with other information. Look these materials over and use them as you desire. I will not have any communications with the public regarding this material. I will always defer to the people responsible for operating the highways. I will be on Maui and available to meet, if you so desire, until February 27th. I'll be back on Maui during the first two weeks in June. If your consultant Jamie Bentz wants to contact me, when we are both in Minnesota, she is welcome to do so. Mahalo for your efforts on this project. I am looking forward to its completion. Dennis R. Eyler Aloha, my wife and I are part-time residents of Maui. We spend 3+ months of the year on island. I am also a retired traffic and highway preliminary design engineer. I am very interested in this project as well as the upcoming planned extension of the Lahaina bypass. As a modest effort on my part to help in the recovery of the area after the Lahaina fire. I am offering my modest assistance, if desired. I have attached my resume and a few technical papers and presentations. Also attached is a more thorough description of my offer of assistance.	151	Ch. 3.14	94	The preliminary alignment design has been based on state and federal design standards and reflects the limitations of right-of-way availability, as well as constraints related to sensitive cultural resources and other environmental considerations. For example, innovative reduced conflict intersection concepts noted in the comment would require additional right-of-way acquisition, including areas potentially containing sensitive cultural resources or other environmental concerns and as a result, would be difficult to implement as part of the Project or result in potentially adverse impacts.
Kim Falinski	The Nature Conservancy	79	Email	Dear Mr. Tatsuguchi, Thank you for this opportunity to provide comments on the Honoapiʻilani Highway Improvements Project (HHIP) Draft Environmental Impact Statement and the proposed preferred alternative, dated January 2025. The Honoapiʻilani Highway from Ukumehame to Launiupoko in West Maui ranks as one of the most threatened highways in the state of Hawaiʻi because of rising sea levels, king tides, storm surges and other coastal hazards fueled by climate change. The Hawaiʻi Department of Transportation has prioritized this important road connecting central Maui to the growing West Maui community because of its risk from coastal erosion. What we are working on. Our team at The Nature Conservancy (TNC) has been working on a ridge to reef approach to protecting and restoring the sensitive environments adjacent to the 939-acre Olowalu reef tract that involve working with community and government partners to establish a vision for a restored coastal area and watershed. We have been excited about the opportunity presented by the highway realignment to collaborate to protect key ecosystem functions. (152) Our comments emphasize the need to protect the unique coral reef and future wetland extent, preserve Pāpalaua sediment retention basin and its sediment capture capacity, design ecologically sensitive stream crossings, and recommend a drainage plan that uses green infrastructure to filter and infiltrate stormwater. With regards to the Honoapiʻilani Highway Improvement Project (HHIP), TNC is focused on three areas: 1) Reducing sedimentation to the coral reef; 2) Implementing a suite of mauka-makai protective and restorative interventions that protect the reef, wetlands and streams, and 3) Visioning, with Hawai`i Department of Transportation, Highways Division (HDOT), County of Maui, partners, and community the future of this existing Honoapiʻilani (makai) highway as a place where people and nature thrive. (153) We see the opportunity to utilize nature-based solutions for preservation and restoration of the coral reef, shorelines, wetlands, recreational spaces, and infrastructure. We have published several reports that may be useful: one on sediment sources, another on wetland extent, and a third on 2022 coral reef surveys.	152 153	Ch. 3.9 Ch. 3.9	62 62	HDOT and the FHWA acknowledge The Nature Conservancy's dedication to the collaborative efforts described in this comment. HDOT is aware of the Olowalu Mauka to Makai project and the Final EIS recognizes these efforts relative to the Project in the Final EIS Chapter 3.20, Cumulative Effects. The Project will involve the implementation of low impact BMPs that are anticipated to manage stormwater and limit additional sediment loading as a result of the Project. These BMPs could include detention ponds to promote infiltration and treatment of discharge generated on-site using industry standard low-impact development practices, such as vegetated swales, vegetated buffers, and bioswales as appropriate (including use of the median, where applicable). Permanent BMPs would be designed to treat stormwater generated by the impervious area of the new roadway as it collects at natural low points along the roadway as defined by the final roadway profile in accordance with the HDOT Storm Water Post-Construction BMPs Manual (February 2022). The design process outlined within the manual includes principles that mimic pre-development hydrologic regimes. The design of permanent BMP measures will consider appropriate hydraulic capacity per HDOT design guidelines.

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Kim Falinski (continued)				Coral reef and wetland ecosystems are in need of protection. Coral reef ecosystems are key to protecting the shoreline from waves and storm impacts, including the current highway, and these systems are threatened by both global and local stressors. Recent studies show that coral larvae are struggling to find places to settle in the sedimented benthos, and that adult corals are subject to sediment and heat stressors. Coral cover remains reduced compared to the 2010s. Corals are not only organisms to protect, they also protect our coastal infrastructure from wave events and sea level rise (Storlazzi et al 2019). Once abundant wetlands in the area are important habitat for endangered waterbirds and plants and serve to provide hazard mitigation in coastal areas, such as absorption and filtering of surface waters and flood reduction. Upland forests both protect soils from erosion and provide essential groundwater recharge function to provide water for nature and people. Sedimentation damages coral reefs. Sediment is one of the most pervasive and damaging threats to coral reef. A recent geomorphological survey by TNC demonstrated that the Pāpalaua watershed is the most degraded watershed in the area, and one of the largest contributors to sediments downstream. Upland shrublands have been decimated by fire and drought in the last twenty years, leading to orders of magnitude higher levels of erosion compared to previous centuries. Former native forest that grew on highly erodible soils in the upland bog have been lost, especially along the edges of the Pāpalaua and Manawaipueo stream basins. Data from the water quality monitoring group Hui O Ka Wai Ola show that all of the coastal areas in the Olowalu-Ukumehame region are above the state coastal turbidity standard, while Ukumehame stream has been highlighted since 2001 (and as recently as 2022) by the Hawai'i Department of Health as an impaired stream because of turbidity.				
				What TNC is doing to help. Olowalu: The Road to Resilience - Community Design for the Existing Highway and Surrounding Areas The planned HHIP provides opportunities to re-imagine the Olowalu-Ukumehame coastal corridor by incorporating park spaces, traditional biocultural practices, and nature-based solutions for coastal resiliency. This project aims to strengthen coastal ecosystems, reduce pressures on the Olowalu-Ukumehame reef system, and improve resilience in the area that includes the existing roadway to adapt to climate change effects, including sea level rise. Through research, analysis, and engagement with stakeholders and community, TNC and University of Hawai`i Community Design Center are leading a process culminating in a conceptual design for local and state stakeholders as the effects of climate change threaten the shoreline. (154)	154	Ch. 3.9	62	HDOT and the FHWA acknowledge The Nature Conservancy's dedication to the collaborative efforts described in this comment. HDOT is aware of the Olowalu Mauka to Makai project and the Final EIS recognizes these efforts relative to the Project in the Final EIS Chapter 3.20, Cumulative Effects. The Project will involve the implementation of low impact BMPs that are anticipated to manage stormwater and limit additional sediment loading as a result of the Project. These BMPs could include detention ponds to promote infiltration and treatment of discharge generated on-site using industry standard low-impact development practices, such as vegetated swales, vegetated buffers, and bioswales as appropriate (including use of the median, where applicable). Permanent BMPs would be designed to treat stormwater generated by the impervious area of the new roadway as it collects at natural low points along the roadway as defined by the final roadway profile in accordance with the HDOT Storm Water Post-Construction BMPs Manual (February 2022). The design process outlined within the manual includes principles that mimic pre-development hydrologic regimes. The design of permanent BMP measures will consider appropriate hydraulic capacity per HDOT design guidelines.
				Through the recently completed first phases of community engagement, specifically referencing the HHIP, we received comments from over 80 participants who voiced common concerns regarding disturbance of cultural resources or `iwi kūpuna as the preferred alternative is pursued; disturbance to Ukumehame Wetlands and native species by the preferred alternative; the desire for sustained access to the shoreline between the new alternative and the existing highway; and concerns around management and maintenance of the land areas between the "old" and the "new" roadways in order to prevent fire, illegal dumping and human encampments. We look forward to working together to help address some of these concerns as our respective projects progress. We appreciate the ongoing support of HDOT as this project moves forward. For more information, please refer to the project engagement website at: https://storymaps.arcgis.com/stories/2ba79613d0aa4da182fe9bc34cc10cc7				

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Kim Falinski (continued)				Collaboration on wetland and mauka restoration. A primary threat to reef health comes not from the sea but from the mountains above: sediment is carried in surface water from mauka lands impacted by non-native feral ungulates, poor land use practices, and fire. These stressors contribute to habitat degradation and erosion. The DLNR Division of Forestry & Wildlife (DOFAW) is embarking on a three-year NOAA Transformational Habitat project, "Olowalu Mauka to Makai," which will implement a full suite of ecosystem-based, mauka-to-makai conservation measures. With DOFAW, TNC will partner with Kipuka Olowalu and Coral Reef Alliance on projects including wetland restoration planning, sediment management, and community engagement, working to address threats and hazards throughout the Olowalu and Ukumehame ahupua`a. This project is inter-related with and impacted by the realignment project, so we look forward to continued communication and collaboration with you as our projects progress. (155) For more information, please refer to: https://dlnr.hawaii.gov/dofaw/	155	Ch. 3.9	62	HDOT and the FHWA acknowledge The Nature Conservancy's dedication to the collaborative efforts described in this comment. HDOT is aware of the Olowalu Mauka to Makai project and the Final EIS recognizes these efforts relative to the Project in the Final EIS Chapter 3.20, Cumulative Effects. The Project will involve the implementation of low impact BMPs that are anticipated to manage stormwater and limit additional sediment loading as a result of the Project. These BMPs could include detention ponds to promote infiltration and treatment of discharge generated on-site using industry standard low-impact development practices, such as vegetated swales, vegetated buffers, and bioswales as appropriate (including use of the median, where applicable). Permanent BMPs would be designed to treat stormwater generated by the impervious area of the new roadway as it collects at natural low points along the roadway as defined by the final roadway profile in accordance with the HDOT Storm Water Post-Construction BMPs Manual (February 2022). The design process outlined within the manual includes principles that mimic pre-development hydrologic regimes. The design of permanent BMP measures will consider appropriate hydraulic capacity per HDOT design guidelines.
				Comments for the EIS. 1. Protect Pāpalaua-Ukumehame wetlands. The degraded wetlands of Pāpalaua and Ukumehame are important for both flood water and sediment retention, and have historically been a crucial part of the Ukumehame watershed hydrologic system. (156) According to local knowledge-keepers, Ukumehame once had thriving wetlands that were home to endangered waterbirds like ae'o and 'alae 'ula, whose habitat along the leeward Maui coast has been reduced by agriculture, development and drought. The draft EIS highlights vestige native plant communities that are surviving in the reduced footprint of the former wetlands, including akulikuli, 'ae'ae, naupaka and milo. Sea level rise is expected to expand the area into where the bypass is proposed to go, and groundwater levels will rise. We will be working with DOFAW on wetland restoration planning in two State parcels that will be affected by the bypass.	156	Ch. 3.9	53	As evaluated in the Draft EIS and this Final EIS, the Project's alternatives were established to avoid and minimize wetland areas and to manage stormwater flow from the new highway with low impact design standards and not hard infrastructure, such as piping storm flows for direct discharge to adjacent waters. As described in Chapter 5 of this Final EIS, the Selected Alternative incorporates many design features that would preserve and not substantially alter water flow from mauka sources towards the ocean. The alignment would be on viaduct over the low lying inundation areas adjacent to the Ukumehame Firing Range and wetlands in the Ukumehame area. Spanning these important ecological features preserves wetlands and wildlife habitat to the greatest extent practicable. Bridges and culverts would allow for continued water flow while crossing the new highway. Based on low impact design standards required by State and federal guidance, stormwater flowing off the new highway pavement would be collected and treated with infiltration basins located in multiple locations along the corridor.
				We agree with the assessment of Ansari and Erickson documented in Section 3.9.3.1 of the prime wetland areas, and we ask you to also consider that ewe identified a broader buffer of wetlands in the regions (Maui Environmental Consultants, 2024) (157).	157	Ch. 3.9	54	Historical distributions and hydrology of water and wetlands, particularly prior to the plantations when in community use, are part of this dynamic landscape. As described in Chapter 5 of this Final EIS, the Selected Alternative has been designed to avoid and minimize adverse effects to waterbodies and wetlands and to not exacerbate historic alterations that have adversely affected wetlands. This is the underlying principle of State and federal protections and policies and the Project has incorporated a comprehensive array of best management practices pursuant to these regulations, most notably the Clean Water Act. As described in Chapter 3.9, Water Resources of the Final EIS, the parameters for wetlands to be considered Waters of the U.S. are defined in 40 CFR 120 and 33 CFR 328.3. The wetland delineations identified a total of 12 wetlands, all found in the Ukumehame area around the Ukumehame Firing Range and totaling approximately 21.403 acres. Figure 3.9 1 identifies these 12 wetlands and their jurisdictional status.
				We appreciate the comment that "new construction in wetlands and floodplains is to be avoided unless there is no practicable alternative to the construction." (3.9-24), and advocate for HDOT to make all efforts to reduce impact to current, former, and potential wetlands, and the proposed wetland restoration area. We strongly advocate that the highway realignment include a viaduct to bypass the existing wetland areas. Wetland areas will likely expand in the future, and existing restoration planning would be adversely affected by the realignment without a viaduct. (158) In particular, wetland birds would struggle to find habitat next to the highway. Efforts to avoid these vital wetlands, as habitats, ecosystems, and areas to retain land-based sediments and remove pollutants would align with the aims of the partners currently working in the area.	158	Ch. 3.9	55	As established in the Draft and Final EIS, the use of a viaduct over wetlands in the vicinity of the Ukumehame Firing Range is a key design commitment that will be required as part of final design and design build contractor obligations.
				2. Reduce sediments and increase groundwater infiltration. We commend efforts to reduce erosion during the project, and advocate for watershed-scale efforts to reduce erosion in the project area more broadly as a strategy to protect the reef. (159) As identified in the draft EIS, the area is comprised of fine alluvial sediments, which are sensitive to disturbance and removal of vegetation. We hope to not only reduce short term sedimentation, but to create a landscape that is more efficient at reducing sediment in the longer term.	159	Ch. 3.9	56	The collaborative efforts of the Honoapi'ilani Highway Improvements Project with The Nature Conservancy and the State of Hawai'i DLNR provide the basis for larger watershed-scale benefits. Chapter 5, Selected Alternative of this Final EIS contains environmental commitments related to water resources. As part of the Project, HDOT will ensure the Contractor adheres to HDOT Storm Water Post-Construction Best Management Practices Manual (February 2022). Site-specific stormwater BMPs would be implemented and/or installed at the staging and work areas by the Contractor to prevent water quality degradation associated with stormwater runoff.

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Kim Falinski (continued)				Maintain the efficiency of Pāpalaua Retention Basin. The maintenance and preservation of sediment retention basins is one of the key methods to hold back sediment in the near-term, as outlined by the West Maui Community Plan, and is the primary intervention needed for Pāpalaua. The Pāpalaua basin serves as the primary retention basin for the Makiwa gulch intermittent stream. The basin has been shown to be a large contributor of fine sediments due to degraded upland conditions. The basin was installed in 1999, and has since filled with sediment above the original height of the standpipes, and has not received regular maintenance. It is at risk of overflow in every storm event, delivering sediment directly into coastal waters. For larger flows the basin is undersized. Additional retention capacity through maintenance and possible redesign is needed to prevent further ecosystem damage to the coral reef. The proposed preferred alternative in Ukumehame reduces the footprint of the basin. Increased attention to replacing the sediment retention capacity is needed. We recommend considering drainage plans upland of the proposed bypass to serve as additional areas for retention. In addition, we would hope that the project would instigate a reconsideration of operations and maintenance of the existing basin, the redevelopment of culverts, and a re-design of the volume of the basin to make sure that it is the most efficient possible for protecting the downstream reef from sedimentation. (160)	160	Ch. 3.9	57	As detailed in Chapter 5 of the Draft EIS, the Preferred Alternative would not reduce the functional capacity of the HDOT detention basin makai of the Ukumehame Firing Range. As a point of clarification, this basin was built in 1970 and primarily drains the Papalaua Gulch. The Makiwa Gulch is located further west of the basin and likely drains through multiple small channels as part of the coastal floodplain, including the Hanaula Gulch, though its direct flow has been altered by historic land use practices. Routine maintenance is performed by HDOT, including sediment removal and vegetation management. Inspection and maintenance protocols adhere to the 2022 HDOT Storm Water Permanent Best Management Practices Manual. In 2023, HDOT brought the basin into a state of good repair, re-establishing the capacity of the basin through restoration of the original bottom of basin elevations and exposing the outfall standpipes. HDOT will continue to monitor the sediment basin annually and remove built up sediment material periodically to ensure that the basin remains effective. The areas that would be occupied by viaduct piers are small and may contribute to a marginal change to volume of water that could be detained at the basin. Use of the viaduct preserves wetlands in the area to the greatest extent practicable while providing for the structural integrity and safety of the viaduct. Large scale redesign of the existing detention basin would be based on a watershed-wide assessment and rethinking of water flows mauka of the firing range and the new highway. This is beyond the jurisdiction of HDOT and out of the scope of potential effects evaluated in this Final EIS. As noted in comments from The Nature Conservancy, such an effort would reasonably be part of the larger watershed initiative of the State of Hawai'i DLNR. As owner of the detention basin, HDOT could be a stakeholder participant in such an effort.
				Incorporate nature-based solutions alongside best practices for stormwater management. The proposed alternative builds would traverse the Olowalu and Ukumehame landscapes approximately along elevation. To address the main threats for the region – namely sedimentation to the reef and future drought/flooding cycles – best management practices for stormwater, groundwater and surface flows that exceed County design standards are needed to protect ecosystem health, along with operations and maintenance plans that are practicable and have clear ownership models. In particular, we recommend that where possible, drainage swales that incorporate grasses and plants that can hold back sediment be used, or a similar nature-based alternative. If possible, the grading plans can include earthen berms to disperse water more broadly for infiltration. (161)	161	Ch. 3.9	58	Consistent with this comment, HDOT's comprehensive approach to stormwater management for the Project is based on low-impact permanent best management practices (BMPs) to lessen effects to water quality caused by stormwater. For the Selected Alternative, there will be about an acre set aside (on average) at eight natural low points for stormwater management infrastructure to capture and detain roadway stormwater. BMPs will be required and, based on final design completed through the design build process after the ROD, they could include detention ponds to promote infiltration and treatment of discharge generated on-site using industry standard low-impact development practices, such as vegetated swales, vegetated buffers, and bioswales as appropriate (including use of the median, where applicable).
				We recommend that the goal for the drainage system be to infiltrate water or deliver it to the wetland instead of shunting it quickly to the ocean. The conceptual study conducted (p. 3.9-25) was not included in the Appendices, so at this point it is not clear on how to collaborate to improve those BMPs to increase infiltration or sediment holding capacity. The draft EIS refers to using 100-yr storms for bridges and 50-yr storms for culverts. It would be important to consider the effects of increased storm intensity, especially for culverts, and how this may impact overall sediment movement on the landscape. (162) The 2018 floods in Kauai showed that large storm events can alter the coastal ecosystem trajectories for many years, if not decades (Rodgers et al 2021). Careful planning may be able to mitigate some of these concerns.	162	Ch. 3.9	59	The Project would be designed consistent with HDOT's Design Criteria for Highway Drainage. In addition to requiring all bridges to be designed for 100-year storm events and all culverts to be designed for 50-year storm events (unless they involve FEMA flood zones, where they will be designed for 100-year storm events), the design criteria also outlines how design discharges are determined, including the use of regression equations that are periodically updated based on observations made by the U.S. Geological Survey. These design standards are intended to ensure that bridges and culvert crossings that carry off site flow across a highway corridor are not significantly altered by the highway, thereby minimizing impacts to these waterways by the highway development itself. Onsite drainage systems will be designed per HDOT's drainage and permanent best management practices policies to ensure treatment of highway generated runoff prior to discharge. Wherever possible, low impact development based designs, such as infiltration ponds/systems, will be utilized to minimize impacts of stormwater runoff from the highway itself. These culverts will meet HDOT standards as well as effectively manage sediment transport, protect the environment, and ensure the safety and longevity of infrastructure.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Kim Falinski (continued)				3. Stream crossing mitigation. Ukumehame and Olowalu streams have been identified by the State of Hawai'i Division of Aquatic Resources (DAR) as important for their aquatic species diversity, with over five species of native fish and invertebrates found in both streams. (163) Hawai'i's native stream animals have amphidromous life cycles meaning that they spend their larval stages in the ocean (salt water), then return to freshwater streams to spend their adult stage and reproduce. Newly hatched fish larvae are carried downstream to the ocean where they become part of the planktonic pool in the open ocean. The larvae remain at sea from a few weeks to a few months, eventually migrating back into a fresh water stream as juvenile hinana, or post larvae. The ability for juvenile fish to migrate upstream is critical to population success.	163	Ch. 3.9	60	As presented in Chapter 3.9 of the Draft EIS and this Final EIS, the Project would be required to provide a bridge spanning the Olowalu and Ukumehame streams, and design standards will be required that prohibit any bridge structures from being within the water course and outside the mean high water level. Coordinating with State and federal agencies, environmental commitments will include construction best management practices and permanent low impact stormwater treatment. Further, the Project's pre-construction, construction, and completion will include water quality and sedimentation monitoring (including in-stream and near shore locations). Overall, no adverse effects on aquatic resources are expected.
				Minimizing long stretches of concretized stream and incorporating small pools and riffles with artificial materials would help to make sure larvae can make it upstream to their final habitat. (164) The draft EIS proposes that either "BMPs that have either been preapproved or coordinated with regulated agencies" be used to minimize water quality effect to the streams (p. 7-4) We would add, though, that the BMPs to assist o'opu migration may be different than those used to mitigate water quality impairment. Consultation with the Division of Aquatic Resources for guidance on best construction may be needed to make the stream habitat functional for Hawaii's stream organisms. (164 Cont.) We advocate that the alternative road scenario be carefully planned to ensure that key bridge crossings are ecologically sound for o'opu `akupa and other diadramous native species.	164	Ch. 3.9	61	The DLNR – Division of Aquatic Resources is a Participating Agency and their input helped guide implementation of best practices to be required for the Project. Full span bridges would be used for the two major perennial streams (Olowalu and Ukumehame Streams) and there is no in-water work planned for the Project at these locations since the bridge embankments would be outside the Ordinary High-Water Mark. Therefore, the Project would not affect species within the Ukumehame and Olowalu streams. Table 3.10-12 of the Draft EIS Chapter 3.10, Flora and Fauna, identifies Avoidance and Minimization Measures that would be implemented as part of the Project. The USFWS has also prepared a Biological Opinion (see Appendix 3.10) with additional commitments identified. As described in Chapter 2, Alternatives and Chapter 5, Selected Alternative, the ultimate determination of culvert and bridge specifications for all crossings in addition to the two perennial streams, or the use of viaducts to span larger areas, is based on identification of the Selected Alternative, the length of the span required, environmental effects, constructability, and cost. These would be finalized during the development of final construction documents as part of the design-build process.
				Recommendations. Given the importance of the above factors, we make the following recommendations for mitigation measures: 1. Preserve the maximum extent of former, current, and potential wetlands; (Section 3.9.8) We support the creation of a viaduct to reduce disruption to the wetland to support future wetland restoration actions on TMKs 48002002, 48002039 48002045, 48002046 and 48002047. 2. Preserve the sediment retention capacity of Pāpalaua basin; (Section 3.11.7) Replace the area used by the bypass in Pāpalaua basin with improved functionality for the area that remains. Remove existing sediments after bypass construction. Improve efficiency by supporting or developing an operations and maintenance plan. Redesign basin to increase sediment retention and flood prevention capacity. 3. Prioritize a drainage plan that uses green infrastructure to filter stormwater and increases groundwater infiltration (Section 3.12.6) Consider drainage systems on the upland side of the bypass that use nature-based approaches to capturing sediment and infiltrating groundwater, such as green-grey drainage swales and vegetated buffers for velocity dissipation. 4. Build ecologically sensitive stream crossings at Ukumehame and Olowalu streams. (Section 3.9.8) If a stream needs to be hardened at the crossover, consider best practices for keeping stream cool, shaded, and oxygenated. The crossings at Olowalu, Ukumehame, and intermittent Pāpalaua streams must be carefully designed for water flow as well as preservation and maintenance of biological processes. Summary. The Nature Conservancy is invested in working with community, State, and County partners on the restoration and revitalization of the Olowalu and Ukumehame ahupua'a from mauka to makai. We look forward to working with you as a partner to ensure lasting benefits for people and nature. Thank you for your consideration, Emily J. Fielding Hawai'i Marine Conservation Director, Kim Falinski, PhD, PE Coastal and Estuarine Scientist				
Shayne Agawa	Maui Department of Environmental Management	80	Email	Thank you for the opportunity to comment on the Honoapiilani Highway Improvements Draft Environmental Impact Statement (DEIS). The County of Maui, Department of Environmental Management has the following comments related to the Honoapiilani Highway Improvements DEIS:				
				A portion of the proposed "common" route appears to encroach onto landfilled waste along the toe of closed Olowalu Landfill. Constructing structures and roadways on landfilled waste should be avoided. Please advise if this project does plan to place the improved highway on top of landfilled waste at the Closed Olowalu Landfill. (165)	165	Ch. 3.18	108	The Selected Alternative would be constructed in the area of the closed Olowalu Landfill but would remain makai of the toe of the slope over covered materials. The roadway realignment will not be located over landfilled waste and the alignment was developed in coordination with the Maui County Environmental Management Division.
				The proposed route also appears to pass through the existing Olowalu Convenience Center (OCC) at the Closed Olowalu Landfill. OCC is the only recycling and waste transfer station for the West Maui community. Please advise if the OCC will be affected, and if so, the plan to relocate the OCC to another location to allow the County of Maui to continue providing this service to the local community. (166)	166	Ch. 3.17	106	As presented in Chapter 3.17 of the Draft, the Preferred Alternative (and all alternatives evaluated) would be anticipated to result in the displacement and relocation of the existing County of Maui recycling and transfer station. Based on information provided by the County, the location at the landfill was not considered a permanent solution and the County has long considered relocation options for this facility to move it closer to the Lāhainā urban center, where most users originate.
				Should you have any questions or comments, please contact Sage Kiyonaga, Solid Waste Engineer, at (808) 270-7941.				

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Mahesh Cleveland	EarthJustice	81	Email	Earthjustice submits the following public comments on the proposed Honoapiʻilani Highway Improvements, West Maui: Ukumehame to Launiupoko (the "Honapiʻilani Project" or "Project"), for which a draft environmental impact statement ("DEIS") was published in The Environmental Notice on January 8, 2025. Earthjustice commends the Hawai'i Department of Transportation ("HDOT") for proactively responding to the climate crisis by undertaking the complex endeavor of realigning portions of the Honoapiʻilani Highway that are highly vulnerable to sea level rise and coastal hazards, and that serve as the main artery to West Maui in an area of high cultural, archaeological, ecological, and recreational significance. We also continue to value and acknowledge HDOT for its groundbreaking leadership and commitments to decarbonizing the state transportation system in accordance with state law and the landmark settlement in the youth-led climate lawsuit Navahine F., et al. v. Dep't of Transp., 1CCV-22-0000631 ("Navahine Settlement"), appended hereto as Attachment A. The Honoapiʻilani Project presents a historic opportunity for HDOT to create a best-in-class model for adapting to climate change (i.e., sea level rise and coastal hazards), while at the same time also mitigating climate change by incorporating sensible bicycle and pedestrian-friendly measures that would ultimately reduce car traffic and greenhouse gas emissions, while promoting public health and mobility for Hawaiʻi's residents. (167) We offer these comments to enhance the Project's climate benefits, and to allow for full consideration of its climate-related impacts, mitigation measures, and alternatives through the environmental review process.	167	Ch. 1	3	Thank you for your comment and your interest in the Project.
				HDOT Should Disclose and Mitigate the Project's Climate Change Impacts, Consistent With the Navahine Settlement. The Navahine Settlement contains provisions to decarbonize the state transportation system through HDOT's transportation projects and their prerequisite environmental review documents. These provisions are key components of the settlement's broader vision, commitment, and roadmap to achieve "zero [greenhouse gas] emissions across all transportation modes within the State," including from "ground transportation" under Haw. Rev. Stat. ("HRS") § 225P-8.[1] HDOT's environmental review of the proposed Honoapiʻilani Project should contain analyses and mitigation measures to reduce greenhouse gas emissions, consistent with the Navahine Settlement and state law. (168)	168	Ch. 3.15	102	As described in Draft EIS, the Project does not generate additional traffic demand since the realignment creates a new and more reliable linkage between West Maui and Central Maui and there would be no up or downstream changes in the transportation network or new anticipated growth or development as a result of the Project. A qualitative analysis was conducted according to agency guidance in place at the time of the Draft EIS. Compared to the No Build Alternative, the Project would not result in a material change in regional criteria air pollutant and emissions. No mitigation measures are proposed for any of the Build Alternatives because no violations of the National Ambient Air Quality Standards or State Ambient Air Quality Standards are anticipated.
				For example, the Navahine Settlement requires HDOT to "implement policies and procedures to ensure that Complete Streets improvements remain part of the project throughout the planning and development process."[2] Hawai'i's Complete Streets statute requires HDOT to "adopt a complete streets policy that seeks to reasonably accommodate convenient access and mobility for all users of the public highways," including "pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities."[3] The mandate applies specifically to "new construction, reconstruction, and maintenance" of highways such as the Honoapiʻilani Project.[4] The Honoapiʻilani Project, as proposed in the DEIS, lacks any Complete Streets improvements for pedestrians, bicyclists, and transit users. (169) The DEIS specifically states that "[t]he Project does not include bicycle lanes or other bicycle or pedestrian facilities for any of the Build Alternatives."[5] The DEIS further notes that once the realignment is complete, the affected portions of the existing Honoapiʻilani Highway will be deeded to County of Maui ("County")[6] for use in conjunction with the West Maui Greenway Plan for a coastal bicycle and pedestrian pathway from Līpoa Point to Ukumehame,[7] while acknowledging that "formal plans have not been developed."8	169	Ch. 5	23	The preliminary design consideration did not include a separate pathway for non-motorized users, and all alternatives would incorporate a standard width shared-use shoulder lane that would accommodate bicyclists. This was intended to provide a direct route to and from the Pali and Lāhainā (including the viaducts and bridges) as a complement and interconnect with the primary bike route served by implementing the West Maui Greenway, which is proposed to be alongside the existing highway. Plans for the West Maui Greenway indicate the greenway is intended to provide a more substantial and integrated shared-use pathway that would be closer to the coastline and away from the main highway. However, based on these and other comments generated during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic (golf carts would not be allowed). As described in Chapter 2 of this Final EIS, the pathway would be constructed along the makai edge of the new highway alignment. At Luawai Street in Olowalu and Ehehene Street in Ukumehame, traffic signals would allow bicyclists and pedestrians to safely cross the new roadway.
				Deeding the existing highway to the County without any certainty or commitments around what will happen to it afterward, while also building a new highway without any designated bike or pedestrian facilities, runs the risk of creating a second roadway or bypass without any Complete Streets accommodations on either. It would also impede compliance with the Navahine Settlement's requirement for HDOT to "complete the pedestrian, bicycle, and transit networks in coordination with the counties as contemplated under HRS § 264-142, with a goal of completing this work in five years."[9] Given that federal and other funding for the West Maui Greenway Plan is uncertain, HDOT should provide funding for the West Maui Greenway Plan Segments 6 and 7, which would be located on or along the portions of the existing highway that will be deeded to the County[10] and have not yet been funded. (170)	170	Ch. 1	35	The Project's primary purpose is to provide a reliable transportation facility in West Maui and improve the resilience of Honoapiʻilani Highway by reducing its vulnerability to coastal hazards. Specifically, the Project is intended to address existing coastal erosion and flooding vulnerabilities as well as future coastal erosion and flooding caused by anticipated sea level rise. The Project provides a reliable transportation facility for vehicles, bicycles, and pedestrians. Funding for the West Maui Greenway Plan is outside of the scope of the Project and this Final EIS.

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Mahesh Cleveland (continued)				HDOT should also include a shaded, protected bike and pedestrian pathway through the center of the realigned highway to comply with the Navahine Settlement and Complete Streets mandate and ensure this $160.8M[11] Project contributes to decarbonizing the state transportation system. This pathway should provide for integration and linkages with the West Maui Greenway, in consultation with stakeholders. (171) Indeed, providing bike and pedestrian facilities in both the original and realigned highways—both of which are contemplated to be (re)constructed in this case—would maximize multimodal accommodations and properly comply with the Complete Streets mandate and other state laws.	171	Ch.2	24	Based on this and other comments submitted during the public review period for the Draft EIS, the Selected Alternative has been refined to incorporate a separated travel way for nonmotorized traffic within the new alignment. However, the provision of a shaded shared-use path through the center of the new alignment would introduce new safety concerns particularly the increase of potential conflicts between pedestrians/cyclists and motorists (especially at intersections). In addition, this would require the addition of fixed objects within the median to protect bicyclists and pedestrians (guardrails and crash cushions). The user experience would be compromised in this environment particularly if a future four lane configuration were implemented. Furthermore, the center median of the new alignment is anticipated to be vegetated to provide for the management of stormwater runoff. Based on preliminary conceptual design, the appropriate location for a new bicycle/pedestrian facility would be along the makai edge of the realigned roadway right-of-way. Given the limitations of the geometry of the roadway—that is, the need to restrict the area of disturbance mauka and makai of the new alignment to avoid cultural resources and other environmental constraints—and the arid nature of the surrounding open landscape, providing shading for this segment of a shared-use path would not be feasible.
				The Navahine Settlement further requires HDOT to "develop and implement an objective, scientifically-based methodology to assess and report the total, long-term [greenhouse gas] emission and [vehicle miles traveled] impacts of each infrastructure project,"[12] specifically for use in "preparing environmental review documents for its transportation projects."[13] Such analyses are not included in the DEIS.[14] (172) Given that HDOT must develop and implement this methodology by April 2025,[15] any subsequent environmental review documents should disclose these Project impacts.	172	Ch. 3.15	103	The Draft EIS was published in December 2024, before the development and implementation of the HDOT methodology applicable to new planning projects initiated after April 2025. Further, as noted in the Draft EIS, the Project is not expected to add travel demand or increase regional VMT so the emissions analysis would show little or no change.
				HDOT should specifically consider and compare the greenhouse gas emissions and vehicle miles traveled impacts of (1) constructing the new highway while closing or keeping the existing highway open to motorist traffic, and (2) including or omitting bike and pedestrian facilities on the existing and new highways. (173) These analyses will enable full disclosure of the Honoapi'ilani Project's impacts, as well as informed consideration of mitigation measures and alternatives.	173	Ch. 3.15	104	Given that the Project would not generate new trips, the Selected Alternative would not be anticipated to result a material change in regional criteria air pollutants or greenhouse gas emissions as compared to the No Build Alternative. Given the limited bicycle and pedestrian activity in the area presently, the incremental difference with or without the bicycle and pedestrian facilities would be minimal. However, for the purposes of presenting a conservative evaluation, such trips are not accounted for in the analysis.
				The Navahine Settlement further mandates that "Level of Service is discontinued as a criterion for project prioritization,"[16] which goes hand-in-hand with the requirement to instead assess each project's greenhouse gas and vehicle miles traveled impacts. As the youth highlighted in Navahine, level of service, a metric assessing how quickly cars move along a roadway, "promotes projects that induce additional traffic and ultimately increase congestion over time and imposes blind spots and barriers against multimodal projects."[17] Any subsequent environmental review documents should avoid use of or reliance on level of service to evaluate the Honoapi'ilani Project.[18] (174)	174	Ch. 3.14	98	As described in Chapter 1 of the Draft EIS, the Project's primary purpose is to provide a reliable transportation facility in West Maui and improve Honoapi'ilani Highway's resilience by reducing its vulnerability to coastal hazards. Overall, Level of Service is not a criteria for the prioritization of this project; rather it is based on the Statewide Coastal Highway Program Report and the Coastal Road Erosion Susceptibility Index ranking system. In Chapter 3.14 of the Draft EIS, Level of Service is provided to confirm that creating the new highway alignment achieves project goals but does not worsen operating conditions. Roadway segment level of service was determined using ranges of volume/capacity ratios based on guidance contained in the Highway Capacity Manual, Seventh Edition: A Guide for Multimodal Mobility Analysis. For the purposes of the transportation analysis, level of service is utilized to quantify the performance of the roadway or element being analyzed.

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Mahesh Cleveland (continued)				HDOT Should Disclose and Consider Alternatives that Account for Updated Sea-Level Rise Projections. HDOT's stated purpose and need for realigning the Honoapi'ilani Highway is "to address existing coastal erosion and flooding vulnerabilities as well as future coastal erosion and flooding caused by anticipated sea level rise."[19] Indeed, around two-thirds of the highway span proposed for realignment "are considered exposed and potentially vulnerable to sea level rise."[20] HDOT acknowledges that, among a variety of potential hazards to transportation infrastructure in West Maui, sea level rise is "the most urgent," while the associated risks of passive flooding, storm surges, and coastal erosion are already occurring and predicted to worsen.[21] (175)	175	Ch. 3.13	90	Effective July 2019, the State of Hawai'i required all new projects undergoing environmental review under the Hawai'i Environmental Policy Act (also known as HRS, Chapter 343) to consider whether the Project is likely to have an adverse effect or be vulnerable to a sea level rise exposure area (SLR-XA), as defined by the 2017 Hawai'i Sea Level Rise Vulnerability and Adaptation Report. This accepted guidance is to use a 3.2-foot sea level rise as a planning target for 2100, with an additional consideration of a 6-foot target in that time frame. The impact evaluation was based on the best available information as the Draft EIS was initiated, and in coordination with the Hawai'i Climate Change Mitigation and Adaptation Commission and the State of Hawai'i DLNR. All alternatives were evaluated based on a 3.2-foot and 6-foot sea level rise scenario. Additional modeling was performed to provide a higher resolution site-specific inundation model to better define the hazards associated with passive and annual high-wave flooding for 3.2 feet of sea level rise. This methodology, as described in Appendix 3.13, Climate Change and Sea Level Rise Supplemental Information, of the Draft EIS is supported by the Intergovernmental Panel on Climate Change Fifth and Sixth Assessment Reports, the HDOT Climate Resilience Action Plan, and the Hawaii Sea Level Rise Vulnerability and Adaption Report. The most mauka alternatives which mostly avoid inundation zones were found to have cultural resource impacts and other environmental adverse effects that resulted in these alternatives not being considered as the
				To fulfill the Project's stated purpose and need to adapt to sea level rise, HDOT should disclose and consider alternatives that account for updated sea level rise projections. The alternatives considered in the DEIS are all based on the conservative assumption that ocean levels will rise by 3.2 feet by 2100.[22] More recent estimates, however, predict that sea level may rise by closer to 4 feet and by as much as 6 feet by 2100,[23] (175 Cont.) which would move the projected sea level rise inundation area further mauka. HDOT should disclose these updated sea level projections and consider alternatives that plan for and adapt to them. Along these lines, HDOT should consider the costs and risks of underestimating sea level rise, including the estimated costs of having to relocate the Honoapi'ilani Highway again in the event of sea level rise exceeds 3.2 feet by 2100.	175	Ch. 3.13	90	
				HDOT Should Disclose and Mitigate the Climate Change Effects from Leaving the Existing Highway In Place. The DEIS acknowledges the harm that climate change and sea level rise are "already causing to the existing highway,"[24] but does not discuss how relinquishing the existing highway to the County will affect the environment. So long as the County keeps the existing highway in place and sea levels continue rising, the existing highway will increasingly serve as shoreline armoring that would harm beach and reef ecosystems, including monk seal habitat.[25] HDOT should, at minimum, consider these harmful effects and measures to mitigate them. (176)	176	Ch. 3.13	91	As noted in the response to Comment 12, part of the rationale for transferring the old highway to Maui County is that once this portion of the roadway is not utilized as the primary transportation link between West Maui and Central Maui, the volume of traffic would be substantially reduced. This allows the County to pursue multiple uses of the old highway such as the West Maui Greenway as well as to consider long-term maintenance measures that are less reliant on shoreline hardening and more conducive to naturalizing the shoreline. The Draft and Final EIS indicated that The Nature Conservancy is evaluating such opportunities along the old highway as part of its "Road to Resilience" initiative. The Draft and Final EIS also acknowledge that once jurisdiction is transferred, there may be conditions in the future that would prevent the old highway from being a continuous link.
				HDOT Should Disclose the Honoapiilani Project's Reasonably Foreseeable Growth-Inducing Effects As discussed in our December 23, 2022 scoping comments, appended hereto as Attachment E, HDOT should disclose and analyze any reasonably foreseeable growth-inducing effects from the Honoapi'ilani Project. For example, to the extent that any plans to develop Olowalu Town are still in the works and would be dependent on implementing the Honoapi'ilani Project, HDOT must address these effects.[26] (177)	177	Ch. 1	15	As established in the Draft EIS, the Honoapi'ilani Highway Improvements Project is not expected to have a growth inducing effect locally or in the larger region. The purpose of the Project is to ensure a reliable and resilient transportation link connecting West Maui with Central Maui. There is no change in up or downstream capacity of the highway and there are no actions included in the Project that would generate new travel demand (that is, no changes in land use, zoning, or development regulations). Specifically, as a limited-access road there would be no new driveways or access points connected directly to the realigned highway, and there is no change in overall development opportunities created by the roadway. Regarding the Olowalu Town Master Plan Project, on December 7, 2015, the State Land Use Commission denied the acceptance of the Final EIS and the project was discontinued. There are currently no filed applications or permits to indicate that the Olowalu Town Master Plan Project would be pursued again. In addition, should the Olowalu Town Master Plan Project (or a project of similar scope or nature) be proposed, it would likely be subject to approvals, potentially involving environmental review and associated public engagement requirements.
				We appreciate the opportunity to comment on the Honoapi'ilani Project, which could be precedent-setting for proactively adapting to climate change, while incorporating sensible and timely design measures to reduce greenhouse gas emissions from transportation. Please contact us if you have any questions or would like to discuss this further. Respectfully submitted, /s/ Mahesh Cleveland Isaac Moriwake Kylie Wager Cruz Mahesh Cleveland EARTHJUSTICE				
Karen Comcowich	Maui County Long Range Division	82	Email	PROJECT DESCRIPTION: The State Department of Transportation is proposing to realign the Honoapi'ilani Highway to provide a reliable transportation facility in West Maui and improve Honoapi'ilani Highway's resiliance by reducing the highways vulnerability to coastal hazards.				
				LONG RANGE DIVISION COMMENTS: The realignment of Honoapi'ilani Highway out of the Sea-Level Rise Exposure Area (SLR-XA) is supported in the Maui County General Plan and more specifically by the West Maui Community Plan. (178)	178	Ch 5	119	Thank you for your comment and your interest in the Project.
				However, multimodal transportation options and Complete Streets elements should be incorporated into the Honoapi'ilani Highway Improvements. In addition, thoughtful consideration should be given to the road design to ensure the realigned highway retains and enhances the existing character and scenic resources found in Ukumehame and Olowalu. The inclusion of trees and landscaping appropriate to the microclimate is also important (179)	179	Ch. 5	120	The Selected Alternative, as documented in the Final EIS/ROD, includes an adjacent shared-use path as part of the highway realignment for bicycles and pedestrians, and two mauka-makai signalized crossings of the corridor that non-motorized vehicles can use. Revegetation for disturbed areas or for landscaping purposes would use native plants found within the project area or native, wildfire resistant plant species. Turf grass would be prohibited, and all landscaping and vegetation maintenance would adhere to the 2011 HDOT Highway Manual for Sustainable Landscape Maintenance. As the area is arid and wildfire risk is a major concern, during dry seasons, vegetation along the roadway would be kept low to avoid risk of fires. Trees along the new alignment are not proposed since there would be limited right-of-way and with limited access to irrigation in an arid area. In addition, trees within a median for this design speed would be a safety concern.
				GENERAL COMMENTS. The realignment of Honoapi'ilani Highway out of the SLR-XA is supported by the West Maui Community Plan (WMCP), the Maui Island Plan (MIP) and the Countywide Policy Plan (CWPP) (see WMCP Policy 2.2.10, and Action 2.21; MIP 6.4.3 Action 3; CWPP H.1.b.). The design of the Honoapi'ilani Highway Improvements will need to incorporate multimodal and Complete Street design elements, while thoughtfully considering the existing character and scenic resources of the communities through which it passes (179 cont.) (MIP 6.4.3 a, and b; CWPP H.1.b, c, and g).	179	Ch. 5	120	

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Karen Comcowich (continued)				WMCP 2.2.10 | Improve resilience of the transportation system to climate change related hazards such as sea level rise, flooding, and wildfires. WMCP Action 2.21 | Work in partnership with the State Department of Transportation to prioritize and facilitate realignment of Honoapi'ilani Highway out of the coastal hazard zone, and manage public lands makai of the realigned highway as wetlands, public parks, and open space. MIP | Goal 6.4 | An interconnected, efficient, and well-maintained, multimodal transportation system. Objective 6.4.3 | An island-wide, multimodal transportation system that respects and enhances the natural environment, scenic views, and each community's character. 6.4.3 a. Ensure that the roadway and transit alignments respect the natural environment and scenic views. 6.4.3 b. Ensure that roadways and transit systems in rural areas and small towns enhance community character. 6.4.3-Action 3 | Urge the State to relocate Honoapi'ilani Highway mauka between the Pali and Puamana, and develop a network of parks and open space on the makai side of the highway, in accordance with the Pali to Puamana Master Plan. CWPP | H. Diversify Transportation Options. Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods. Objective 1: Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable. b. Plan for the efficient relocation of roadways for the public benefit. c. Support the use of alternative roadway designs, such as traffic-calming techniques and modern roundabouts. d. Increase route and mode options in the ground-transportation network. e. Ensure that roadway systems are safe, efficient, and maintained in good condition. g. Design new roads and roadway improvements to retain and enhance the existing character and scenic resources of the communities through which they pass. CONCERNS AND OPPORTUNITIES. Multimodal Transportation. The Maui County General Plan, including the West Maui Community Plan, supports transportation projects that increase active transportation, including biking and walking, and transit services. Honoapi'ilani Highway is the primary connection between West Maui and the rest of the island of Maui. Designing the realigned portions of the highway to support transit, bike and pedestrian access would provide multiple benefits from resilience actions by increasing transportation options and making walking and bicycling safe and easy between and within communities. (180) WMCP 2.2.1 | Improve West Maui's active transportation network by increasing multimodal transportation options, incorporating Complete Streets, adding new sidewalks, and improving existing sidewalks and other pedestrian and bicycle facilities. WMCP 2.1.4 | Prioritize projects that provide multiple benefits from resilience actions. WMCP 2.2.5 | Support increased transit service within and between West Maui's neighborhoods, parks, and commercial areas, and between the Kahului Airport and West Maui hotels. WMCP 2.5.9 | Encourage and increase active transportation options throughout West Maui to promote public health and reduce auto use and carbon emissions. MIP| Goal 6.4 | An interconnected, efficient, and well-maintained, multimodal transportation system. Objective 6.4.1 | Provide for a more integrated island-wide transportation and land use planning program that reduces congestion and promotes more efficient (transit-friendly) land use patterns. 6.4.1.a. Plan for an integrated multi-modal transportation system comprised of public transit, bicycle, pedestrian, automobile, and other transportation modes. 6.4.1.b. Refocus transportation investment from the construction of additional roadways only for the automobile to the expansion of a multimodal transportation system. 6.4.1.c. Encourage the use of "complete streets" design methods. MIP | Goal 6.5 An island-wide transit system that addresses the needs of residents and visitors and contributes to healthy and livable communities. Objective 6.5.1 | An integrated transit system that better serves all mobility needs of Maui's residents and visitors. 6.5.1.b. Expand regional and inter-regional transit services, where appropriate, in heavily traveled corridors and within communities. 6.5.1.e. Require new development where appropriate, to provide right-of-ways (ROWs) to accommodate transit circulation and support facilities. 6.5.1.f. Identify, protect, and preserve, or acquire corridors for future inter-community transit use, including but not limited to, rail and also multimodal use corridors. CWPP | H. Diversify Transportation Options. Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods. Objective 2: Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation. a. Make walking and bicycling transportation safe and easy between and within communities. b. Require development to be designed with the pedestrian in mind. c. Design new and retrofit existing rights-of-way with adequate sidewalks, bicycle lanes, or separated multi-use transit corridors. d. Support the development of a countywide network of bikeways, equestrian trails, and pedestrian paths.	180	Ch. 5	121	The new highway alignment would likely be compatible with through travelling buses since the alignment would be controlled with no driveways or curbside uses which can disrupt through movements. Local bus service would be expected to leave the new alignment to serve the Olowalu Village via connector roads and the existing highway that would become a local road serving community uses. The Selected Alternative, as documented in the Final EIS/ROD, includes an adjacent shared-use path as part of the highway realignment for bicycles and pedestrians, and two mauka-makai signalized crossings of the corridor that non-motorized vehicles can use.

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Karen Comcowich (continued)				Trees and Landscaping. The West Maui Community Plan and Countywide Policy Plan support the inclusion of trees along public right of ways. The West Maui Community Plan specifies the use of native trees and landscaping that is appropriate to the microclimate. Trees and other appropriate landscaping should be included in the realigned Honoapi'ilani Highway Improvements. (181)	181	Ch. 5	122	Appropriate landscaping will be included in the realigned Honoapi'ilani Highway in accordance with the 2011 HDOT Highway Manual for Sustainable Landscape Maintenance. Native vegetation found in the project area will be used for revegetation efforts along with native, wildfire resistant species to reduce the risks associated with wildfires. During the dry season, the area immediately adjacent to the roadway will be mowed to keep vegetation low to prevent the risk of fuel buildup/wildfires. While certain native trees grow in the area, there is a constrained right-of-way to incorporate tree planting and limited access for irrigation in an arid area. However, as part of avoidance and minimization measures for the endangered Hawaiian hoary bat, large trees would be preserved in place to the greatest extent practicable.
				WMCP 2.1.11 | Require new developments to install landscaping that reduces water use, using drought resistant and micro-climate appropriate design and plants including native species, and gray water and water catchment systems where the State Department of Health allows it. WMCP 2.3.4 | All development must implement recommendations of the Maui County Planting Plan for street and parking area trees, encouraging the use of native and endemic plants. Plants that are on the Hawai'i Pacific Weed Risk Assessment list must not be used. WMCP 2.3.12 | Design landscape barriers along major roadways in such a manner as to maintain existing views of the mountains and ocean to the extent possible. WMCP 2.5.5 | Include native trees that are appropriate for the microclimate in parks, along streets, trails, and greenways, and throughout the community to provide shade, beauty, and reduce sediment runoff. CWPP | H. Diversify Transportation Options. Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods. Objective 4: Improve and expand the planning and management of transportation systems. h. Accommodate the planting of street trees and other appropriate landscaping in all public rights-of-way.				
				Natural and Cultural Resources. The Maui County General Plan, the MIP and the WMCP all support protecting and enhancing natural and cultural resources. This includes using Low Impact Development strategies and vegitated buffers around gulches and wetlands, giving consideration to how agriculture areas will be impacted, particularly where there is active subsitance farming or lo'i cultivation, and ensuring access to kuleana lands. It is noted that the project proponents have consulted with community members in development of the Environmental Impact Statement Preparation Notice, including the Aha Moku Council and Lineal Decedents. As final alignment and design for Honoapi'ilani Highway Improvements are refined, protecting, and enhancing natural and cultural resources should be a priority. Continued involvement and collaboration with community members as plans are refined is encouraged. (182)	182	Ch. 5	123	The alternatives considered potential impacts to natural and cultural resources, and the Selected Alternative provides the best balance to achieve the Project's purpose and need and minimize and avoid adverse effects. Consultation with descendants and other individuals and organizations with a demonstrated interest in the Project (referred to as "consulting parties") is ongoing as part of the National Historic Preservation Act Section 106 and the Hawai'i Revised Statutes, Chapter 6E processes. The Executed Programmatic Agreement (Appendix 3.6 of the Final EIS) provides the framework for commitments on resource evaluation and mitigation as well as continued consultation with interested participants.
				WMCP 2.2.9 | Protect and enhance natural and cultural resources during implementation of transportation projects through early consultation and community engagement with resource management agencies, residents, and cultural practitioners. WMCP 2.3.1 | Ensure new development projects provide continued access to kuleana lands protected under Section 7-1, Hawai'i Revised Statutes. WMCP 2.3.2 |Gulches, as identified in the map in Figure 2.3 of this Plan, must remain in open space and no new permanent structures may be developed in or within 100 feet of the top of the bank of identified gulches, unless Low Impact Development strategies are implemented to prevent stormwater runoff. WMCP 2.3.3 |Protect ocean and stream water quality by requiring that wetlands, as defined by traditional historic knowledge or by Section 404 of the Clean Water Act, be preserved with vegetated buffer areas that are adequate to protect them from pollutants. WMCP 2.3.5 | Require implementation of Low Impact Development practices in developments in West Maui to reduce stormwater runoff and protect water quality. WMCP 2.3.8 | Preserve and protect the region's cultural resources and traditional lifestyles, including agricultural pursuits, such as subsistence agriculture on lands owned by the State Department of Hawaiian Home Lands in Honokōwai and lo'i cultivation of Native Hawaiians in Honokōhau Valley, Kahoma Valley, Kaua'ula Valley, Olowalu, and Ukumehame. WMCP 2.3.10 | Existing areas of open space, including agricultural lands and gulches, should be viewed as a resource to be protected and enhanced. WMCP 2.3.13 | The marine and nearshore environment and open space areas are important assets of the region and should be protected and preserved. Habitat connectivity for threatened and endangered species, watersheds, undeveloped shoreline areas and other environmentally sensitive lands must be preserved. WMCP 2.3.16 | All development projects must engage in consultation with the Aha Moku 'o Maui representative associated with the project area – either Moku 'o Lāhainā or Moku 'o Kā'anapali – and provide evidence of this engagement to the Department. WMCP 2.3.18 | Any ground-altering activities in the areas described in this Plan's ascription list must have a cultural monitor on site, due to the sensitive nature of these areas, until cultural overlay policies are established by the Council. See Appendix C | Cultural Reserve Ascription List.				

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Karen Comcowich (continued)				MIP | Goal 2.1 | Our community respects and protects archaeological and cultural resources while perpetuating diverse cultural identities and traditions. Objective 2.1.3 | Enhance the island's historic, archaeological, and cultural resources. 2.1.3.f | Support opportunities for public involvement with the intent to facilitate the protection and restoration of historic and archeological sites, including consultation with stakeholders.2.1.3.g | Encourage the resolution of land title questions relating to Land Commission Awards and Royal patents. 2.1.3.h | Ensure compliance with historic preservation laws, and discourage demolition of properties that are determined to be eligible for listing on the National or State Register of Historic Places. CWPP| B. Preserve Local Cultures and Traditions | Goal: Maui County will foster a spirit of pono and protect, perpetuate, and reinvigorate its residents' multi-cultural values and traditions to ensure that current and future generations will enjoy the benefits of their rich island heritage. Objective 1: Perpetuate the Hawaiian culture as a vital force in the lives of residents. a. Protect and preserve access to mountain, ocean, and island resources for traditional Hawaiian cultural practices. f. Recognize and preserve the unique natural and cultural characteristics of each ahupua'a or district. h. Ensure the protection of Native Hawaiian rights. Objective 2 | Emphasize respect for our island lifestyle and our unique local cultures, family, and natural environment. d. Recognize the interconnectedness between the natural environment and the cultural heritage of the islands.				
				Trails. The protection and enhancement of trails is encouraged throughout the Maui County General Plan. While it is not expected that the Honoapi**'ilani Highway Improvements will develop additional trails, preservation of existing trails and** options for new connections should be incorporated. (183)	183	Ch. 5	124	There are no existing public hiking trails that are along the proposed highway alignment. The trailhead for the West Lāhainā Pali trail is located along the existing highway about a half mile further south (towards Maalaea). The existing Olowalu subdivision shared-use path, which is largely built out by the private owners, will be disrupted by the Selected Alternative. As presented in this Final EIS, the continuity of the path would be tied into the pathway alongside the makai alignment of the Selected Alternative.
				WMCP 2.5.8 | Ensure existing government trails are preserved through the subdivision process or other approval process, such as land use designation change; reviews under Chapter 343, Hawai'i Revised Statutes; and reviews under Chapter 205A, Hawai'i Revised Statutes. Refer to the West Maui Trails Map (Figure 2.4, pg. 61) and consult with the Nā Ala Hele Trails and Access Program. WMCP 2.5.3 | Support the development of trails and greenways in West Maui as part of a larger integrated recreation and transportation network and manage existing public mauka to makai access along the tops of gulches as identified in Figure 2.3 (pg. 60) to prevent the spread of rapid 'Ōhi'a death, feral ungulates, and other invasive species in upper watersheds. MIP | GOAL 2.1 |Our community respects and protects archaeological and cultural resources while perpetuating diverse cultural identities and traditions. OBJECTIVE 2.1.1 | An island culture and lifestyle that is healthy and vibrant a smeasured by the ability of residents to live on Maui, access and enjoy the natural environment, and practice Hawaiian customs and traditions in accordance with Article XII, Section7, Hawai`i State Constitution, and Section7-1, Hawai`i Revised Statutes(HRS). 2.1.1.c Ensure traditional public access routes, including native Hawaiian trails, are maintained for public use. MIP | Goal 6.6 |Maui will have a diverse range of active and passive recreational parks, wilderness areas, and other natural-resource areas linked, where feasible, by a network of greenways, bikeways, pathways, and roads that are accessible to all Objective 6.6.3 | An expanded network of greenways, trails, pathways, and bikeways. 6.6.3.c Collaborate with the State and private land owners to ensure perpetual access and proper stewardship of traditional trails and access systems. CWPP | H. Diversify Transportation Options Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods. Objective 2: Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation. e. Support the reestablishment of traditional trails between communities, to the ocean, and through the mountains for public use. CWPP | G. Improve Parks and Public Facilities Goal: A full range of island-appropriate public facilities and recreational opportunities will be provided to improve the quality of life for residents and visitors. Objective 1 | Expand access to recreational opportunities and community facilities to meet the present and future needs of residents of all ages and physical abilities. a. Protect, enhance, and expand access to public shoreline and mountain resources. b. Expand and enhance the network of parks, multi-use paths, and bikeways.				
				Undergrounding Utlities. Undergrounding utilities is supported throughout the Maui County General Plan. This may be an opportunity to work with MECO to underground utilities in the area where improvements are being implemented. (184)	184	Ch.5	125	The Honoapi'ilani Highway project is compatible with this plan element in that the corridor is suitable to accommodate new utility systems, although no utility realignments are proposed. As described in Chapter 3.17 of the Draft and Final EIS, the new alignment would have no existing or future driveways or access points to properties requiring local utility connections. Therefore, the existing system for local distribution would remain along the existing Honoapi'ilani Highway for local uses or from the Olowalu and Ukumehame subdivision utility lines which are already primarily below ground. Regional transmission lines parallel the highway but are considerably mauka of the developed areas up into the higher elevations and would require a major regional change to its routing if it were to be accommodated within the new highway alignment.

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Karen Comcowich (continued)				WMCP 2.5.20 | Promote the placement of utilities underground in new areas of development and in existing areas, where possible, unless desecration of iwi kūpuna is likely to occur or if the development lies within areas of significant cultural resources in the proposed cultural overlay, a permit will be required. CWPP | I. Improve Physical Infrastructure Goal: Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies. Objective 4: Improve the planning and management of infrastructure systems. j. Promote the undergrounding of utility and other distribution lines for health, safety, and aesthetic reasons. Scenic Resources and Community Character. Ensuring scenic vistas and community character are considered and retained in the design of new roads or roadway improvements is supported in the WMCP, the MIP and the CWPP. While it is evident that the Honoapi'ilani Highway Improvements have considered the impacts of the alignment on the character and scenic resources of the surrounding area, it will also be important consider the character and scenic resources of the surrounding area in the design of the road and how it interacts with the surrounding communites. (185) WMCP 2.3.11 | Protect public mauka to makai view corridors in each subarea and scenic vistas. MIP| Goal 6.4 | An interconnected, efficient, and well-maintained, multimodal transportation system Objective 6.4.2| Safe, interconnected transit, roadway, bicycle, equestrian, and pedestrian network. 6.4.2.a Ensure transit-, roadway-, and pedestrian-facilities design and level-of-service standards respect the unique character of our communities. Objective 6.4.3 | An island-wide, multimodal transportation system that respects and enhances the natural environment, scenic views, and each community's character. 6.4.3.c Design all transit systems to respect visual corridors and Maui's character. CWPP | H. Diversify Transportation Options Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods. Objective 1: Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable. o g. Design new roads and roadway improvements to retain and enhance the existing character and scenic resources of the communities through which they pass.	185	Ch. 5	126	The proposed new alignment will largely weave through the community outside the village center in Olowalu and the parks and beaches in Ukumehame. As the comment notes, the potential visual character of the Project is evaluated in Chapter 3.8 of the Draft and Final EIS. The visual impact assessment identifies recommended guidelines to best integrate the road design with the character and scenic resources of the community.
				Parks and Open Space. Although this is not part of the scope of this project the realignement will offer the possibilty to achieve goals supported by the Maui County General Plan regarding protection and enhancement of shoreline resources, the developement of Parks and Open Space, and altenative modes of transportation makai of the realigned highway. (186) WMCP 2.1.5 | Protect the shoreline and beaches by preserving waterfront land within the SLR-XA as open space wherever possible. MIP | Goal 6.4 | An interconnected, efficient, and well-maintained, multimodal transportation system Objective 6.4.2: Safe, interconnected transit, roadway, bicycle, equestrian, and pedestrian network. 6.4.2.e Consider identification, acquisition where appropriate, and utilization of abandoned rightof-ways for bikeways, pedestrian pathways, and open-space networks. MIP | Goal 6.6 Maui will have a diverse range of active and passive recreational parks, wilderness areas, and other natural-resource areas linked, where feasible, by a network of greenways, bikeways, pathways, and roads that are accessible to all Objective 6.6.3 An expanded network of greenways, trails, pathways, and bikeways. 6.6.3.a Link existing and future park sites, natural areas, the shoreline, and residential areas with a network of bikeways, pedestrian paths, trails, and greenways. 6.6.3.b Support the implementation of plans and programs that facilitate pedestrian mobility and access to active and passive recreation areas and sites. CWPP | H. Diversify Transportation Options Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods. Objective 1: Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable. f. Preserve roadway corridors that have historic, scenic, or unique physical attributes that enhance the character and scenic resources of communities. CWPP | A. Protect the Natural Environment Goal: Maui County's natural environment and distinctive open spaces will be preserved, managed, and cared for in perpetuity. Objective 2: Improve the quality of environmentally sensitive, locally valued natural resources and native ecology of each island. a. Protect and restore nearshore reef environments and water quality. e. Mitigate the negative effects of upland uses on coastal wetlands, marine life, and coral reefs. CWPP | L. Mitigate Climate Change and Work Toward Resilience Goal: Minimize the causes and negative effects of climate change. Objective 2: Reduce the impacts of sea-level rise by acknowledging climate change, adapting, mitigating, and planning accordingly. Policies: a. Evaluate development to assess potential short-term and long-term sea-level rise impacts on nearshore environments. b. Improve efforts to mitigate and plan for the impact of sea-level rise. c. Protect undeveloped beaches, dunes, and ecosystems, and restore natural shoreline processes. e. Strengthen coastal-zone management, re-naturalization of shorelines, where possible, and filtration or treatment of urban and agricultural runoff.	186	Ch. 3.5	127	Thank you for your comment and your interest in the Project.

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Francisco Dóñez	Environmental Protection Agency	83	Email	The U.S. Environmental Protection Agency has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA). The CAA Section 309 role is unique to EPA. It requires EPA to review and comment on the environmental impact of any proposed federal action subject to NEPA's environmental impact statement requirements and to make its comments public. EPA 309 Review Summary. EPA did not identify significant concerns to be addressed in the final EIS. (187) We acknowledge and recognize our colleagues in the state for continuing the NEPA process to analyze and deliver this project following the devastating wildfire impacts to Lahaina just north of the proposed project area. We provided scoping comments to the Hawaii Department of Transportation and Federal Highways Administration and accepted the invitation to provide early coordination as defined in Title 23 United States Code Section 139(d) and (5), and Title 40 Code of Federal Regulations, part 1508.5 on April 29, 2022. We note that many of our scoping comments were adopted in the development of the Draft EIS, and that our November 1, 2024, comments on the Administrative Draft EIS regarding aquatic resources and community engagement were fully addressed in the Draft EIS. (187 Cont.) We appreciate HDOT and FHWA's emphasis of continuing community dialogue (page 3.7-14) as it pertains to protecting cultural resources pursuant to the National Historic Preservation Act, Section 106. The EPA appreciates the opportunity to review this DEIS. If you have any questions, please contact me at (415) 972-3659 or the NEPA reviewer, Zac Appleton, at (415) 972-3321 or appleton.zac@epa.gov	187	Ch. 1	16	Thank you for your comment and your interest in the Project.
Chelsie Javar-Salas	USFWS	84	Email	We recommend culverts and bridges over streams be designed with the height and width to handle periodic massive surges of water from torrential rain events that are known to occur in the area. Due to climate change, 100-year storms may become more frequent. Flooding has the potential to destroy ae**ʻo (Hawaiian stilt, Himantopus mexicanus knudseni) and** nēnē (Hawaiian goose, Branta sandvicensis) nests that may be found in the project area. Additionally, ensuring culverts and bridges have the height and width to handle 100-year storm torrential rains may also minimize impacts to other trust resources protected under the Fish and Wildlife Coordination Act. (188) These recommendations also apply to Appendix 3.10 section 2.2.1.	188	Ch. 3.9	68	As set forth in the Draft EIS and this Final EIS (see Chapters 2 and 3.9), the Project would be designed consistent with HDOT's Design Criteria for Highway Drainage. Design flows are determined utilizing the National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server website. Stream crossings would be designed to preserve water flow and the biological processes of the fauna living in them. In addition to requiring all bridges to be designed for 100-year storm events and all culverts to be designed for 50-year storm events (unless they involve FEMA flood zones, where they will be designed for 100-year storm events), the design criteria also outlines how design discharges are determined, including the use of regression equations that are periodically updated based on observations made by the U.S. Geological Survey. These design standards are intended to ensure that bridges and culvert crossings that carry off-site flow across a highway corridor are not significantly altered by the highway, thereby minimizing impacts to these waterways and habitats by the highway development itself. Wherever possible, low impact development and nature-based designs, such as infiltration ponds/systems, will be utilized to minimize impacts of stormwater runoff from the highway itself. These designs will meet HDOT standards as well as effectively manage sediment transport, protect the environment, and ensure the safety and longevity of infrastructure.
				For erosion control during construction, we recommend using materials (e.g., biosock) that are at least 3 feet (ft) in diameter to reduce chances of runoff into the ocean during torrential rain. (189) The typical 1 ft diameter biosock will likely not serve as an adequate barrier during torrential rainfall, especially in an area that is highly degraded, expansive ephemeral wetland habitat combined with known high flow rates in streams during these storm events. Sedimentation runoff onto the beach and into the ocean degrades sea turtle habitat and has the potential to bury sea turtle nests. This emphasizes the importance of incorporating our Best Management Practices (BMPs) for Work In and Around Aquatic Environments to minimize project impacts. These BMPs may also help minimize impacts to other trust resources protected under the Fish and Wildlife Coordination Act. (189 Cont.)	189	Ch. 3.9	69	HDOT employs the use of its Construction Best Management Practices Field Manual to govern the development of Site Specific BMP Plans during construction. The manual describes appropriate use and diameter width for Compost Filter Berm/Socks which include limitations on placement in areas where high volumes or velocities of flow are anticipated and recommends other methods/materials for sediment control in such situations. The USFWS BMPs for Work In and Around Aquatic Environments have been agreed to and incorporated into the Project design (see Draft EIS Table 3.10-16).
				The DEIS describes monitoring for waterbirds by a qualified biologist, but then follows up with: The contractor will assign dedicated, trained, competent personnel to perform daily visual monitoring and nest surveys prior to the start of and during construction work to check for listed species bird nests. The daily monitoring protocol would include designated personnel to walk the project site every morning prior to the start of construction work to determine if any ESA-listed species nests are present at the work site and note if any listed individuals were present. All surveys to detect for the presence of ae**ʻo** nests and ae**ʻo exhibiting defensive nest protection behavior should be carried out by a qualified biologist with knowledge of the** species' life history. If heavy rains result in ephemeral wetlands, **ʻ**alae ke**ʻ**oke**ʻ**o (Hawaiian coot, Fulica alai) should be surveyed for as well. (190)	190	Ch. 3.10	73	The Biological opinion from USFWS is found in Appendix 3.10 and the environmental commitments are summarized in Chapter 5 of this Final EIS. This refined protocol includes but is not limited to; qualified biologist would be on-call throughout the duration of construction to assist in monitoring, surveys, and in an advisory capacity; prior to the initial clearing and grubbing phase of the Project, a qualified biologist would be on-site to perform visual surveys for listed species and nests. Should individuals or nests be observed, then species specific buffers and protocol would apply; prior to the start of any construction activities, a qualified biologist would produce a handout on listed species that occur within the Action Area and present a mandatory Environmental Awareness Program to on-site personnel, including but not limited to contractors, contractor's employees, supervisors, inspectors, and all subcontractors. USFWS would be contacted to review the awareness program prior to administering to on-site personnel; the qualified on-call biologist would be present on-site once every three weeks, or as needed, to provide training to new on-site personnel; should work be halted for more than 72 hours, the on-call biologist shall be contacted to survey the area prior to resumption of work.

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Chelsie Javar-Salas (continued)				The DEIS describes morning surveys and monitoring for nēnē by a qualified biologist, but then follows up with: The contractor will assign dedicated, trained, competent personnel to perform daily visual monitoring and nest surveys prior to the start of and during construction work to check for listed species bird nests. The daily monitoring protocol would include designated personnel to walk the project site every morning prior to the start of construction work to determine if any ESA-listed species nests are present at the work site and note if any listed individuals were present. All surveys to detect for presence of **nēnē** nests and **nēnē** exhibiting defensive nest protection behavior should be carried out by a qualified biologist with knowledge of the species' life history. (191)	191	Ch. 3.10	74	See Response 69 (above); a qualified biologist would be on-call throughout the duration of construction to assist in monitoring, surveys, and in an advisory capacity; prior to the initial clearing and grubbing phase of the Project, a qualified biologist would be on-site to perform visual surveys for listed species and nests.
				We recommend including all final biological survey and monitoring protocols in the final EIS under Appendix 3.10. We encourage your team to submit draft survey and monitoring protocols/standard operating procedures to our office for review and comments prior to finalization. We also encourage incorporating adaptive management into these procedures and triggers for modifying them. (192)	192	Ch. 3.10	75	Biological survey and monitoring protocols are finalized in the Section 7 Biological Opinion (BO) prepared by USFWS (Appendix 3.10).
				The draft EIS states additional biological surveys will be performed by trained biologists in areas of "permanent BMPs." The Service recommends providing more details about this objective, including protocols and habitat features that support listed species in the draft EIS. (193)	193	Ch. 3.10	76	As set forth in Appendix 3.10, biological surveys were performed by qualified biologists in areas of "permanent BMPs" that were not included in previous surveys. This additional assessment evaluated and affirmed that the full range of environmental effects and environmental commitments first identified in the Draft EIS remain the basis of the BO from USFWS (Appendix 3.10 of this Final EIS)
				We recommend that temporary signs be placed around the project area during construction to remind workers of the potential presence of **aeʻo** and **nēnē** and to drive slowly (10 miles per hour as stated in the DEIS). Additionally, permanent signs should be placed along the highway through the Ukumehame wetland area alerting drivers of the potential presence of **aeʻo** and **nēnē** and for reducing the speed limit through the area to minimize injury and mortality to listed birds from vehicle strikes. (194)	194	Ch. 3.10	77	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS).
				Avoid placing staging areas in or directly adjacent to wetland habitat (jurisdictional and nonjurisdictional) and streambanks identified by the consultants to avoid and minimize impacts to habitat that supports listed waterbirds and **nēnē**. (195)	195	Ch. 3.10	78	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS).
				Any hazing that occurs to **nēnē** must follow the 4(d) rule. We recommend keeping a copy of the regulations at the on-site office for easy reference. A key section of the 4(d) rule follows: Before implementing any such intentional harassment activities during the **nēnē** breeding season (September through April), a qualified biologist knowledgeable about the nesting behavior of **nēnē** must survey in and around the area to determine whether a nest or goslings are present. If a nest is discovered, the Service must be notified within 72 hours and the following measures implemented to avoid disturbance of nests and broods: No disruptive activities may occur within a 100-ft (30-meter) buffer around all active nests and broods until the goslings have fledged; Brooding adults (i.e., adults with an active nest or goslings) or adults in molt may not be subject to intentional harassment at any time; and The landowner must arrange follow-up surveys of the property by qualified biologists to assess the status of birds present. (196)	196	Ch. 3.10	79	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS).
				Hawaiian yellow-faced bees are known to occur in scattered populations along the western coastline of Mauna Kah**ālā**wai (Maui Komohana or West Maui Mountains). Coastal populations of yellow-faced bees occur in habitat along rocky shorelines with naupaka (Scaevola taccada) and tree heliotrope (Heliotropium arboreum) with either landscaped vegetation, nonnative kiawe (Neltuma pallida), or bare rock inland. Bees are restricted to an extremely narrow corridor, typically 33 to 66 ft (10 to 20 meters) wide, and do not occur on barren sandy beaches or inland, or on landscaped native plants on hotel grounds. Documented nectar plants include naupaka, **ʻ**ilima (Sida fallax), **ʻ**akoko (Euphorbia spp.), pua kala (Argemone glauca), naio (Myoporum sandwicense), and tree heliotrope. Threats to yellow-faced bees include habitat destruction and modification from land use change, nonnative plants, ungulates, and fire, along with predation by nonnative ants and wasps. Mahalo for including the Service's avoidance and minimization measures for coastal Hawaiian yellow-faced bees. (197)	197	Ch. 3.10	80	We appreciate the USFWS providing these measures and have included them as commitments as presented in Chapter 5 of this Final EIS.

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Chelsie Javar-Salas (continued)				Table 3.9.10 states that project effects on listed waterbirds and nēnē would be minimal due to the implementation of avoidance and minimization measures outlined in Appendix 3.10. The project may potentially impact aeʻo and nēnē. Therefore, we recommend that the cumulative impacts analysis in the draft EIS include an assessment for the construction phase and the normal operations phase. This should specifically address how the highway designs in the Ukumehame area will avoid car strikes and minimize impacts to aeʻo and nēnē. Additionally, we encourage your team to consider the anticipated increase in waterbird populations (aeʻo and ʻalae keʻokeʻo) and nēnē in the Ukumehame area following wetland restoration when conducting the cumulative impact analysis. Currently, neither Chapter 3.10 nor the Biological Resource Discussion in Appendix 3.10 includes an evaluation of the impacts to listed waterbirds and nēnē from the routine operations of the new highway after construction. (198)	198	Ch. 3.10	81	This comment is consistent with the assessments outlined in the Section 7 BA and the BO (Appendix 3.10 of this Final EIS). As described in Chapter 3, Affected Environment and Reasonably Foreseeable Effects of this Final EIS, on February 19, 2025, CEQ issued a memorandum, Implementation of the National Environmental Policy Act, which acknowledged that the Fiscal Responsibility Act of 2023 amended NEPA to clarify that EISs must analyze and disclose the "reasonably foreseeable environmental effects of the proposed agency action." CEQ encouraged Federal agencies to "analyze the reasonably foreseeable effects of the proposed action consistent with section 102 of NEPA, which does not employ the term 'cumulative effects;'[...and the agencies should consider] 'reasonably foreseeable' effects, regardless of whether or not those effects might be characterized as 'cumulative.'" Further, since the publication of the Draft EIS, the U.S. Supreme Court issued its decision in Seven County Infrastructure Coalition v. Eagle County, Colorado, which held the focus of NEPA is the project at hand, not other separate projects. 605 U.S. ____ (May 29, 2025). Accordingly, this Final EIS analyzes reasonably foreseeable effects that result from the proposed action. The Honoapiʻilani Highway Improvements Project considers reasonably foreseeable effects to have a rational link to the Project in terms of geographic and temporal proximity and must be sufficiently likely to occur.
				The draft EIS states nighttime work is not anticipated; however, if it does become necessary, the DOT and FHWA will consult with the Service (see Appendix 3.9, page 4). Chapter 3.10, Table 3.10.9 states the project does not anticipate to impact seabirds, as standard Service seabird avoidance and minimization measures will be implemented. However, Table 3.10.5 mentions that nighttime work may occur, but not during the seabird fallout season. Please confirm whether nighttime work will occur during the seabird fallout season. If it is determined that nighttime work will occur during the seabird fallout season, we recommend contacting our office several months in advance for guidance to avoid adverse impacts to listed seabirds. Additionally, we recommend following the 2022 Maui Dark Skies Ordinance for all permanent lighting. For permanent lighting, limit these lights as human safely considerations allow, and include light frequencies and intensities that have the least impact on seabirds and sea turtles. There is also a growing body of peer-reviewed literature and seabird groups to help guide you with the most current animal friendly lighting. (199)	199	Ch. 3.10	82	Following completion of the Draft EIS, nighttime work commitments were made such that nighttime work is limited in scope and duration and would be specifically at the tie-in points to the existing roadways (at the Lāhainā Bypass to the north, at the Pali to the south) in order to prevent traffic delays. Nighttime work would not be allowed during the seabird fallout season. The 2022 Maui Dark Skies Ordinance for all permanent lighting has already been incorporated into the commitments described in this Final EIS (Chapter 5).
				For revegetation efforts, we recommend using only native plants, in particular those documented in the biological survey: ʻilima (Sida fallax), ʻiliahialoʻe (Santalum ellipticum), ʻaʻaliʻi (Dodonaea viscosa), hoary abutilon (Abutilon incanum), akulikuli (Sesuvium portulacastrum), milo (Thespesia populnea), and naupaka (Scaevola taccada). If possible, we recommend avoiding disturbance to endemic plant species such as ʻiliahialoʻe that currently occupy the project area. ʻIliahialoʻe is an endemic plant species to the Hawaiian Islands. Limiting disturbance of non-listed endemic plants help to prevent their decline. (200)	200	Ch. 3.10	83	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS).
				For erosion control, we recommend following our comment in Chapter 3.9 above related to biosocks. To minimize collisions for seabirds, we recommend: Flagging the tops of monopoles, cranes, and crane wires/cables. Flagging fencing that extends above vegetation. (201)	201	Ch. 3.10	84	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS).
				To avoid and minimize invasive species potential impacts to ESA listed species, we recommend incorporating our invasive species biosecurity protocols into your project planning (202) Attachment A). The proposed project will be transporting a substantial amount of materials (i.e., construction materials or aggregate, etc.), vehicles, machinery, equipment, and personnel between sites, which has the potential to unintentionally introduce invasive species to the project site. (202 Cont.)	202	Ch. 3.10	85	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS).

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Chelsie Javar-Salas (continued)				Under Mammals, the DEIS states that **ʻōpeʻapeʻa** (Hawaiian hoary bat, Lasiurus cinereus semotus) have not been detected on Maui and cites Tomich 1986. Current data show that **ʻōpeʻapeʻa** do occur on Maui (203): https://dlnr.hawaii.gov/wildlife/files/2021/01/MauiBatsHTHFebruary2020.pdf The DEIS states that if scheduling becomes a serious issue and cutting down or pruning trees taller than 15 feet cannot be avoided during the bat breeding season (June 1 through September 15), FHWA will consult with the Service. We recommend FHWA consult with us several months in advance if scheduling is anticipated to prevent implementing the Service's avoidance and minimization measures for **ʻōpeʻapeʻa** or any other listed species that occurs or may occur in the project area. (203 Cont.)	203	Ch. 3.10	86	Under Section 3.10.3.2 Mammals, the Draft EIS states that "There are records for this species on Maui, and their potential presence is assumed within the project area" and then cites Tomich 1986. This Final EIS states in Chapter 5, that if bat breeding season cannot be avoided for cutting down or pruning trees taller than 15 feet, the contractor would contact the USFWS five months in advance for guidance.
				Please include Service avoidance and minimization measures for sea turtles (honu (green sea turtles, Chelonia mydas) and honu**ʻea (Hawksbill sea turtles, Eretmochelys imbricata)). Construction on, or in the vicinity of, beaches can result in sand** and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff, and an increase in direct and ambient light pollution, which may disorient hatchlings or deter nesting females. Off-road vehicle traffic may result in direct impacts to sea turtles or nests, and contributes to habitat degradation through erosion and compaction. (204) Information for projects with a beach hardening, stabilization, or nourishment component: Projects that alter the natural beach profile, such as nourishment and hardening, including the placement of seawalls, jetties, sandbags, and other structures, are known to reduce the suitability of on-shore habitat for sea turtles. These types of projects often result in sand compaction, erosion, and additional sedimentation in nearshore habitats, resulting in adverse effects to the ecological community and may inhibit future sea turtle nesting. The hardening of a shoreline increases the potential for erosion in adjacent areas, resulting in subsequent requests to install stabilization structures or conduct beach nourishment in adjacent areas. Given projected sea level rise estimates, the likelihood of increase in storm surge intensity, and other factors associated with climate change, we anticipate that beach erosion will continue and likely increase. Where possible, projects should consider alternatives that avoid modifying or hardening of coastlines. Beach nourishment or beach hardening projects should evaluate the long-term effect to sea turtle nesting habitat and consider the cumulative effects.	204	Ch. 3.10	87	
				Avoidance and minimization measures include: No vehicle use on or modification of the beach/dune environment during the sea turtle nesting or hatching season (See nesting date ranges above); Do not remove native dune vegetation; Have a biologist familiar with sea turtles conduct a visual survey of the project site to ensure no basking sea turtles are present; If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area; Cease all activities between the basking turtle and the ocean; Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used; Do not stockpile project-related materials in the intertidal zone, reef flats, sandy beach and adjacent vegetated areas, or stream channels. (204 Cont.)	204	Ch. 3.10	87	This comment is consistent with the environmental commitments incorporated into this Final EIS (see Chapter 5) and as presented in the USFWS BO (Appendix 3.10 of this Final EIS). As noted in Chapter 5, since completion of the Draft EIS, nighttime work commitments have been made such that nighttime work is limited in scope and duration and would be specifically at the tie-in points to the existing roadways (at the Lāhainā Bypass to the north, at the Pali to the south) in order to prevent traffic delays. Nighttime work would not be allowed during the sea turtle nesting/hatching season. According to shapefiles downloaded from USFWS Ecos, https://ecos.fws.gov/ecp/species/C00S#crithab, there is no USFWS PIFWO 07/19/2023 proposed critical habitat for Hawaiian green sea turtle (Chelonia mydas) overlapping the northern end of the project area. The closest proposed critical habitat for Chelonia mydas is located in Lāhainā, approximately 2.8 miles from the northern terminus of the Project.
				Optimal sea turtle nesting habitat is a dark beach free of barriers that restrict sea turtle movement. Nesting turtles may be deterred from approaching or laying successful nests on lighted or disturbed beaches. They may become disoriented by artificial lighting, leading to exhaustion and placement of a nest in an inappropriate location (such as at or below the high tide line). Hatchlings that emerge from nests may also be disoriented by artificial lighting. Inland areas visible from the beach should be sufficiently dark to allow for successful navigation by hatchlings to the ocean. To avoid and minimize project impacts to sea turtles from lighting we recommend: Avoiding nighttime work during the nesting and hatching season; Minimizing the use of temporary and permanent lighting on or near beaches and shield all project-related temporary and permanent lights so the light is not visible from any beach; If lights can't be fully shielded or if headlights must be used, fully enclose the light source with light filtering tape or filters; Incorporating design measures into the construction or operation of buildings adjacent to the beach to reduce ambient outdoor lighting such as tinting, reducing the height of exterior lighting to below 3 feet and pointed downward or away from the beach, and minimizing light intensity to the lowest level feasible and, when possible, include timers and motion sensors. (204 Cont.)	204	Ch. 3.10	87	
				Implementing our sea turtle avoidance and minimization measures, including our BMPs for Work In and Around Aquatic Environments, will also help avoid and minimize project impacts to sea turtle nesting habitat, including proposed critical habitat that overlaps with the northern end of the project area. Additionally, we recommend keeping workers, staging areas, and temporary resting equipment on the mauka side of the old highway, away from the beach, especially during sea turtle nesting season and within the proposed green sea turtle critical habitat. (204 Cont.)	204	Ch. 3.10	87	

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Chelsie Javar-Salas (continued)				We recommend including conceptual designs of the preferred alternative viaduct through the Ukumehame area, including identified wetland habitat (jurisdictional and nonjurisdictional) in the area, architectural/design features aimed at reducing car strikes for nēnē and listed waterbirds (e.g., diversion poles and/or guardrails), and any land alterations to assist with stormwater management and highway runoff as described in section 3.9.8 of Chapter 3. (205)	205	Ch. 5	128	Conceptual designs of the Preferred Alternative and viaduct were provided in the Section 7 BA for USFWS PIFWO review and use in development of the Biological Opinion (Appendix 3.10 of this Final EIS), as are the identified wetland habitat in the area, and preliminary typical section drawings of the proposed highway and stream crossings (with guardrails). Conceptual designs of the diversion poles to be affixed to the viaduct have not been developed, but dimensions and placement are described in the BA as extending approximately 6 feet (1.8 meters) above the 54-inch (137 centimeters) rail and spaced approximately 12 feet (3.7 meters) apart across the length of and on both sides of the viaduct. As described in Chapter 2, Alternatives of the Draft EIS, the ultimate determination of culvert and bridge specifications, or the use of viaducts to span larger areas, would be based on identification of the Preferred Alternative, the length of the span required, environmental effects, constructability, and cost. This would be finalized during the development of final construction documents as part of the design-build process.
				In section 5.1.1.3, the DEIS mentions guardrails would be placed on either side of the viaduct. We recommend clarifying whether the architectural design features aimed at reducing listed bird car strikes will be placed on one side or both sides of the highway. (206)	206		129	The Final EIS specifies that diversion poles would be included on both sides of the viaduct. Guardrails would be placed on either side of the roadway and viaduct. Preliminary designs for the viaduct and roadway are included in typical section drawings in the BA.
				We recommend providing more details about the swales (Appendix 3.10) to control stormwater, and other highway design features aimed at minimizing highway contaminant runoff into wetland habitat to reduce impacts to nēnē, aeʻo, and other listed waterbirds that may use the wetland habitat in the project area. Specifically, clarify where the stormwater will be diverted to or be collected, and will these areas have the potential to attract nēnē and listed waterbirds. (207)	207		130	The Selected Alternative would traverse the wetland area on the viaduct. Stormwater flow from the elevated viaduct would run along the parapet walls until the width of the water running along the wall reaches a threshold to enter a closed drainage system where it would flow through downspouts attached to the piers to a permanent BMP at ground level. Proposed locations of permanent BMPs are shown in the BA. The final design established as part of the design-build process would determine the design, size, and location of the permanent BMPs, including conceptual detention ponds to promote infiltration and treatment of discharge generated on-site, and incorporation of Low Impact Development strategies, such as vegetated swales in the median and on the outside edges of the pavement structure to the maximum extent practicable. Revegetation strategies outlined in the BA and in the Biological Opinion (Appendix 3.10 of this Final EIS) would prohibit the use of turf grass, and include native species found within the project area. Regular maintenance of the permanent BMPs would deter nēnē and listed waterbirds.
				Additionally, the proposed grassy swales adjacent to the road may increase the risk for nēnē car strikes. We recommend you inquire with the Nēnē Recovery Action Group about the proposed grassy swales and for potential alternative options for the swales, as applicable. (208)	208		131	The project team reached out to the Nēnē Recovery Action Group about best practices for proposed grassy swales and potential alternatives. No additional recommendations were provided.
Andrew Viloria	-	85	Webform	Aloha, I recognize this may be too late, but as a lifelong citizen I do not want this highway to cut through our only outdoor flat open firing range. It would make the inaccesibility of sport shooting that much more difficult for Hawaii citizens. Please reconsider these changes. (209) Mahalo, Andrew	209	Ch. 3.5	36	The Draft EIS and this Final EIS established and evaluated alternatives specifically with the understanding of the importance of the Ukumehame Firing Range to the community. As a public recreational resource, the firing range was further evaluated under the FHWA's obligation pursuant to Section 4(f) of the USDOT Transportation Act. Preservation of the use of the facility contributed to the identification of the Preferred Alternative such that the crossing of the new highway alignment was more makai than the original Build Alternatives 1 and 4 evaluated in the Draft EIS. By placing the alignment on a viaduct over the HDOT detention basin, the elevation of the viaduct will provide for a minimum of 20 feet of clearance for the existing firing range driveway, allowing for enough clearance for most emergency vehicles and trucks that may need to enter the facility.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Cesar Ivan Martin del Campo Garcia	Maui Grass Farm LLC	86	Webform	Dear Project Team, I am writing to express my support for the Honoapi'ilani Highway Improvements Project and its goals to improve transportation infrastructure while addressing environmental and safety concerns. I appreciate the effort and planning involved in designing a project of this scale to benefit our community. However, I would like to address a critical issue regarding the classification and evaluation of Parcel 48002115, which has been flagged for full acquisition under Build Alternative 1. It is essential that the property's current and planned uses are accurately reflected in the project documentation to ensure an equitable and informed process. 1. Misclassification of Parcel Use. The current project documentation categorizes Parcel 48002115 as "not in use," which does not accurately reflect its status. Specifically: The parcel is actively utilized for grass farming operations, supported by established water connections and other agricultural infrastructure. Farming activities are currently underway, generating revenue and contributing to the agricultural economy of the area. This active farming operation and planned development demonstrate that the parcel is a valuable and productive asset, rather than idle or undeveloped land. 2. Support for the Project and Request for Reevaluation. I fully support the objectives of the Honoapi'ilani Highway Improvements Project and recognize the importance of enhancing the region's transportation network. At the same time, I request the following: 1. *Reevaluation of Parcel 48002115's classification in project documentation to accurately reflect its active agricultural use, ongoing farming operations, and planned developments* . 2. Assurance that compensation and project decisions account for the parcel's true value and active use, rather than being based on an inaccurate "not in use" designation. (210) Collaborative Approach. I remain committed to working collaboratively with the HDOT and project team to support the project's success. By addressing this issue and ensuring an accurate representation of Parcel 48002115, we can achieve a fair and equitable outcome that aligns with the project's goals while respecting the contributions of local landowners. Conclusion. I respectfully request that the project team reevaluate the classification of Parcel 48002115 and ensure its active farming operations and development plans are accurately reflected in all documentation. I look forward to working with the HDOT to address these concerns and support the successful implementation of this important project. Thank you for your time and attention to this matter. Please feel free to contact me if additional details or documentation would be helpful. Sincerely, Cesar Ivan Martin del Campo Garcia President, El Toro Soysia Turf - Maui Grass Farm LLC	210	3.4	29	During development of the Draft EIS in 2022 and 2023, property record searches along with field reconnaissance and review of Geographic Information Systems (GIS) mapping and data layers did not reveal the level of activity as described in the comment. HDOT recognizes that property ownership and use activities initiated by owners will change over time—especially in an area where subdivisions have occurred—and this information was updated accordingly in the Final EIS. Most importantly, any updated and current information will be integrated into the process of determining land value and fair compensation if the property must be acquired as part of the Project (see Chapter 3.4 of the Final EIS, which includes an explanation of how the Uniform Relocation Act establishes the protocol that must be followed in the acquisition process as well as HDOT's guidelines for right-of-way acquisition). In Ukumehame, Build Alternative 1 has been determined to be the basis of the Preferred Alternative, so the alignment is directly through Parcel 48002115. This indicates that a full acquisition of the parcel would be required. Once final design has determined the requirements for property acquisition, a representative of HDOT Right-of-Way will contact the property owner to start the process. The Final EIS Chapter 3.4 has been revised to reflect this updated information.

Commentor	Organization	Submission No.	Submission Type	Comment	Comment No.	DEIS Section	Ch. 9 Comment No.	Response
Lee Chamberlain	Maui Bicycling League	87	Webform	Dear Hawai‘i Department of Transportation (HDOT) and Federal Highway Administration (FHWA), I am writing to express strong support for the integration of the West Maui Greenway (WMG) into the Honoapi‘ilani Highway realignment project. The WMG, as part of the Hele Mai Maui Legacy Projects, offers a unique and timely opportunity to promote sustainable, multimodal transportation that strengthens resilience and community connectivity in West Maui. (211)	211	Ch. 3.5	31	
				1. Strategic Implementation of Segment 6 (211 Cont.) The WMG Final Report (September 2022) identified Segment 6 (Olowalu to Lahaina Pali Trailhead) as a priority due to its potential to repurpose the existing Honoapi‘ilani Highway. Alternative A was evaluated as the top-performing route, benefiting from its scenic views, strong recreational connections, and the minimal need for new right-of-way (ROW). By utilizing the existing highway, this option is not only cost-effective but also highly feasible, despite its location within the sea-level rise (SLR) exposure area.	211	Ch. 3.5	31	
				2. Compliance with the Navahine Settlement Commitments (211 Cont.) The WMG supports the Navahine Settlement’s requirement to expand multimodal transportation infrastructure, including pedestrian pathways and bikeways, to reduce vehicle miles traveled (VMT) and support decarbonization goals. • Public Transit, Pedestrian, and Bikeway Expansion: The WMG aligns with interim goals for multimodal projects that integrate alternative transportation options across the state. • Specific Deadlines: Key elements, including pedestrian and cycling infrastructure, are to be incorporated into the planning and budgeting cycles starting by April 2025, in line with the Mid-Range Transportation Plan (MRTP) and the Statewide Transportation Improvement Program (STIP). • Budgeting Prioritization: Projects such as the WMG that align with decarbonization and VMT reduction goals will be prioritized, with a five-year timeline set for completion of key multimodal infrastructure expansions.	211	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume. As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.
				3. Integration with Complete Streets Policy (211 Cont.) The Complete Streets policy requires all transportation projects to prioritize the safety and accessibility of all users, including pedestrians, cyclists, and transit riders. • Policy Integration: The WMG is a model project for implementing Complete Streets, ensuring safe pedestrian and bike pathways, public transit access, and roadway infrastructure improvements that support walking and cycling. • Complete Streets Assessment: Beginning with the April 2025 planning cycle, all Capital Improvement Projects (CIPs), including the WMG, will undergo a Complete Streets assessment to document adherence to these principles. Any exceptions must be justified to ensure transparency and accountability. • Expenditure Prioritization: The WMG’s focus on multimodal connectivity positions it for prioritization within the Complete Streets framework, ensuring that it receives the necessary funding and resources to move forward.	211	Ch. 3.5	31	
				4. Alignment with Act 131 and the Hawai‘i Bike Plan (211 Cont.) The WMG aligns with Act 131’s mandate for a fully multimodal, accessible, and sustainable transportation system, as well as the Hawai‘i Bike Plan’s goals of creating a statewide network of protected bikeways. Act 131 emphasizes the importance of separated pathways that improve public safety, health, and quality of life, all of which are central to the WMG’s design.	211	Ch. 3.5	31	
				5. Environmental and Permitting Benefits By repurposing the existing highway, the WMG may qualify for a Categorical Exclusion (CE) under 23 CFR 771.111(f) due to its minimal environmental impact. This reduces the need for extensive environmental reviews and allows for faster implementation while maintaining compliance with state and federal environmental standards. 6. Public Health and Emergency Preparedness The WMG contributes to improved public healthoutcomes by encouraging active transportation and providing equitable access to safe, recreational spaces. Additionally, the greenway can serve as a non-motorized evacuation route during emergencies, supporting West Maui’s resilience and emergency response capabilities.				
				Recommendation: I respectfully urge HDOT and FHWA to incorporate the West Maui Greenway into the Honoapi‘ilani Highway realignment plan by repurposing the existing highway for Segment 6. This approach will maximize cost-efficiency, adhere to state and federal policy goals, and enhance West Maui’s safety, resilience, and community connectivity. (212) Thank you for your commitment to building a sustainable and resilient transportation future for West Maui. Sincerely, Lee Chamberlain Maui Bicycling League Advocacy Chair	212	Ch. 3.5	31	Implementing the West Maui Greenway (by the County) along the existing highway is considered a future condition that is fully compatible with the Honoapi‘ilani Highway Improvements Project. The West Maui Greenway is not included in the Project because its ultimate design, funding, approvals and implementation would be a separate process led by Maui County. After the highway is realigned, jurisdiction of the existing Honoapi‘ilani Highway would be transferred to the County of Maui, and the roadway would continue to carry vehicular traffic that serves local traffic (business, residences, beaches, parks) but with less volume.As set forth in Chapter 5 of this Final EIS, and based on public comments on the Draft EIS, the new Honoapi‘ilani Highway alignment will incorporate a separate and protected shared-use path along the makai side of the new right-of-way (including two locations for protected crosswalks of the new highway). This will add flexibility and provide for integration with the West Maui Greenway, should it be constructed in the future.

DEIS Public Comments – Commentor Submissions

From: Lee Chamberlain <lachamb91@gmail.com>
Sent: Tuesday, January 7, 2025 1:57 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Cc: Speicher, Meredith <meredith_speicher@nps.gov>; Saman Dias <samandias.skd@gmail.com>; Donna Clayton/Jerome. <djclaytonmaui@gmail.com>
Subject: [EXTERNAL] Honoapiʻilani Highway realignment project

Dear Mr Tatsuguchi

Hawaiʻi Department of Transportation (HDOT) and Federal Highway Administration (FHWA),

I am writing to express strong support for the integration of the West Maui Greenway (WMG) into the Honoapiʻilani Highway realignment project. The WMG, as part of the Hele Mai Maui Legacy Projects, presents a significant opportunity to foster sustainable, multimodal transportation that strengthens resilience and community connectivity in West Maui.

1. Strategic Implementation of Segment 6

The WMG Final Report (September 2022) identified **Segment 6 (Olowalu to Lahaina Pali Trailhead)** as a priority due to its potential to repurpose the realigned Honoapiʻilani Highway. **Alternative A** scored highest in the evaluation due to its scenic views, strong recreational connections, and the minimal need for new right-of-way (ROW). By utilizing the existing highway, this option is both cost-effective and highly feasible, despite its location within the sea-level rise (SLR) exposure area.

2. Compliance with the Navahine Settlement Commitments

The WMG supports the Navahine Settlement's mandate to expand multimodal transportation infrastructure, including pedestrian pathways and bikeways, to reduce vehicle miles traveled (VMT) and support decarbonization goals.

- **Public Transit, Pedestrian, and Bikeway Expansion:** The WMG aligns with interim goals to integrate alternative transportation options statewide.
- **Specific Deadlines:** Planning and budgeting for multimodal infrastructure must begin by April 2025, per the Mid-Range Transportation Plan (MRTP) and the Statewide Transportation Improvement Program (STIP).
- **Budgeting Prioritization:** Projects such as the WMG that align with decarbonization and VMT reduction goals are prioritized within a five-year timeline for infrastructure completion .

3. Integration with Complete Streets Policy

The WMG is a model project for the Complete Streets policy, which requires transportation projects to prioritize safety and accessibility for all users.

- **Policy Integration:** The WMG will create safe, separated pathways for cyclists and pedestrians and improve public transit access.
- **Complete Streets Assessment:** Beginning in April 2025, all Capital Improvement Projects (CIPs), including the WMG, must undergo assessments to document compliance with Complete Streets principles.
- **Expenditure Prioritization:** The WMG's focus on multimodal connectivity positions it for priority funding under the Complete Streets framework, ensuring that resources are allocated to support this vital project.

4. Alignment with Act 131 and the Hawaiʻi Bike Plan

The WMG aligns with Act 131's requirement for a multimodal, accessible, and sustainable transportation system and the Hawaiʻi Bike Plan's vision for a statewide network of protected bike paths. Act 131 emphasizes separated pathways that improve public safety, health, and quality of life..

5. Current Funding and Federal Support
The WMG has secured significant financial support, including:

- **RAISE Grant:** $15 million awarded to the WMG to support development and implementation efforts.
- **Inclusion in STIP (MC28):** Ensures that the project is recognized as a priority for state and federal transportation funding allocations .

This available funding underscores the importance of expediting the WMG by integrating Segment 6 into the Honoapi‘ilani Highway realignment project, ensuring that the funds are utilized effectively and within the required timelines.

6. Environmental and Permitting Benefits
Repurposing the existing highway corridor may qualify for a Categorical Exclusion (CE) under 23 CFR 771.111(f), as the project involves minimal environmental impact. This streamlined approach reduces the need for extensive environmental reviews and accelerates project implementation.

7. Public Health and Emergency Preparedness
The WMG will enhance community health by promoting active transportation and equitable access to safe recreational spaces. Additionally, the greenway can function as a non-motorized evacuation route, supporting emergency response efforts in disaster scenarios.

Recommendation:
I respectfully urge HDOT and FHWA to incorporate the West Maui Greenway into the Honoapi‘ilani Highway realignment plan by repurposing the existing highway for Segment 6. This approach will maximize cost-efficiency, adhere to policy mandates, and support West Maui’s resilience, safety, and community connectivity goals.

Thank you for your commitment to building a sustainable and resilient transportation future for West Maui.

Sincerely,
Lee Chamberlain

Maui Bicycling League Advocacy Chair

--
Lee A. Chamberlain
lachamb91@gmail.com
(925) 917 1994

"The optimist expects the wind;
the pessimist complains about the wind;
the realist adjusts the sails."

From: Thorne Abbott <coastalplanners@gmail.com>
Sent: Wednesday, January 8, 2025 12:42 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] eis comment

We fully support. Hdoh's efforts of adaptive realignment of this critical highway inland. Previously the County approved a subdivision in the Ukumehame section for highway relocation and creation of a linear coastal park. County council also authorized purchase of the land to relocate the highway inland, uphill and out of the tsunami inundation zone. This may be a prudent route to use for the relocated highway.
Mahalo!
Thorne Abbott
Coastal Planners, LLC
(808) 344-1595
www.CoastalZone.com

From: Carter Barto <carter@aloha.storage>
Sent: Thursday, January 9, 2025 10:53 AM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; honoapiilanieis@online.wspis.com
Cc: ekbarto@gmail.com; Tamara Barto <Tamarabarto@mac.com>
Subject: [EXTERNAL] Support of the Honoapiilani Highway Realignment and Expansion

Aloha,

I am writing to express my strong support for the proposed project to realign Honoapiilani Highway inland and please also expand it from two lanes to four lanes. As a daily commuter who relies on this highway to travel between my job in West Maui and my home in Pukalani, I have firsthand experience with the challenges posed by the current state of this vital roadway. The most recent alignment proposal makes the most sense for the long term viability of this highway.

Honoapiilani Highway serves as the sole viable connection between these regions, making it a critical infrastructure for residents, businesses, and visitors alike. However, its current alignment and capacity have proven inadequate in meeting the demands of a growing population. Increasing traffic is often caused by whale watchers, high tides washing salt water over the road, and frequent traffic jams or closures due to accidents and brush fires. The need for this project is both urgent and clear, and I urge decision-makers to prioritize its implementation for the following reasons:

1. **Safety:** The existing highway's proximity to the coastline exposes it to flooding, erosion, and other hazards, particularly during extreme weather events. Relocating the highway inland will enhance safety for all users

by mitigating these risks. Additionally, the expansion to four lanes will reduce congestion-related accidents by allowing for smoother traffic flow, safer overtaking opportunities, and detour options during unfortunate closures caused by fatal traffic accidents.

2. **Economic Vitality:** As the primary route connecting West Maui to Central Maui, Honoapiilani Highway supports the movement of goods, services, and workforce. This need has dramatically increased following the August 2023 fires, which displaced much of the workforce to Central Maui, adding additional daily commuters who still work in West Maui. Delays and disruptions caused by traffic congestion or road closures have a significant economic impact. A four-lane highway moved inland will ensure more reliable and efficient travel, benefiting local businesses and sustaining economic growth.
3. **Quality of Life:** For daily commuters like myself, the current two-lane configuration often results in extended travel times and frustration. On some occasions, I have been unable to return home or make it to work, losing an entire workday or being forced to stay overnight. The proposed re-alignment along with an expansion to four lanes will alleviate congestion, allowing residents to spend less time on the road and more time with their families or engaging in their communities.
4. **Environmental Considerations:** While moving the highway inland may raise concerns about environmental and cultural impacts, the current alignment's vulnerability to sea-level rise and coastal erosion poses a long-term environmental threat. A carefully planned realignment can minimize ecological and cultural disruption while safeguarding the highway's longevity.
5. **Emergency Preparedness:** In times of natural disasters or emergencies, Honoapiilani Highway serves as a critical evacuation route and access point for emergency services. Expanding the highway's capacity and moving it to a safer location will ensure that it can fulfill this role effectively.

I urge the State of Hawaii DOT and County of Maui to act swiftly to approve, fund, and complete this project. The benefits of an inland, four-lane Honoapiilani Highway far outweigh the costs, and its timely completion is essential for the safety, economic stability, and overall well-being of our community.

Thank you for considering my comments. I appreciate the opportunity to contribute to this important decision-making process.

Mahalo,

Carter Barto
General Manager
Aloha Self Storage Lahaina
23 Ulupono Street, Lahaina, HI 96761
Office: 808.661.2775
Fax: 808.661.1989
Mobile: 808.298.6418
Email: carter@aloha.storage
Website: www.Aloha.Storage

Outlook

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Sun 1/12/2025 5:04 PM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Janice and James
Last Name: Revells
Email Address: kimo501999@aol.com
Join Mailing List: True
Comment:
The proposed route does not show access to the Ukumehame Firing Range nor beach accesses for the general public. The four ranges are used almost daily by the numerous clubs and MPD. There is also a building used for firearm safety classes. Driving to Laniupoko and then returning toward Kahului to get to access the ranges and the beaches is ludicrous. The majority of the users are local and are coming from Central. Upcountry and South Maui. Driving miles into Lahaina to just turn around to get back to the ranges and beaches is stupid. . Not having reasonable accesses to this area would encourage criminal activity and safety and health hazards. Response time for First Responders would be greatly increased. The general public needs are not being served. This realignment serves to improve drive time into Lahaina and the beauty and use of this area is Lost..

Comment Log Submission No. 4

Outlook

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Sun 1/5/2025 10:34 AM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Victoria
Last Name: Kaluna-Palafox
Email Address: vkalunapalafox1@gmail.com
Join Mailing List: False
Comment:
My concern is to not disturb the true function of Aina. That, can never be repaired, unless we can better protect, what is. Mahalo

Comment Log Submission No. 5

Outlook

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Thu 1/9/2025 9:22 AM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Kevin
Last Name: Bridges
Email Address:
Join Mailing List: False
Comment:
Alternative 1 would be the best alternative as it provides the shortest distance and will provide outstanding views. However, the preferred alternative would adequately address the ocean flooding issue and stand a better chance of not being delayed with nuisance lawsuits. My biggest comment is to speed up the construction timeline. The proposed construction timeline is way too long; this needs to be done now! The federal government just provided $2 billion for Lahaina housing needs so that should free up state and local money to get this project started and finished sooner. The vulnerability threat to west side is only getting worse with time and needs to be fixed sooner rather than later. Get this extremely critical project finished sooner.

Comment Log Submission No. 6

Outlook

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Thu 1/9/2025 10:26 AM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Carter
Last Name: Barto
Email Address: waiakoa@gmail.com
Join Mailing List: True
Comment:
I express strong support for the proposed project to realign Honoapiilani Highway inland and please also expand it from two lanes to four lanes. As a daily commuter who relies on this highway to travel between West Maui and Central Maui, I have firsthand experience with the challenges posed by the current state of this vital roadway. Honoapiilani Highway serves as the sole viable connection between these regions, making it a critical infrastructure for residents, businesses, and visitors alike. However, its current alignment and capacity have proven inadequate in meeting the demands of a growing population and increasing traffic. The need for this project is both urgent and clear, and I urge decision-makers to prioritize its implementation.

Comment Log Submission No. 7

Outlook

Comment Log Submission No. 8

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Mon 10/28/2024 6:23 AM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Darrell
Last Name: Tanaka
Email Address: sunshineorchids@gmail.com
Join Mailing List: False
Comment:
The homeless situation is getting worse in Olowalu, they are slowly taking over the beach area at Mile Marker 14....when the new highway is built that area will become a derelict destination....we should make it into a state park and manage it to prevent it from being trashed, its a popular tourist and local spot to take kids to the beach and snorkel and fish...in fact, make the area from Ukumehame park all the way to Olowalu general store a state beach park.

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Sun 11/17/2024 12:55 PM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Benny
Last Name: Martin
Email Address: tcbhawaii@gmail.com
Join Mailing List: True
Comment:
My family and I, like so many others, were deeply affected by the devastating wildfires in Lahaina. We lost our home and everything we had worked so hard for. In the aftermath, we saved what we could and decided to purchase an agricultural lot in the Ukumehame subdivision, where many other displaced families have also found a place to rebuild. It has been a journey of resilience, and the Ukumehame subdivision offers us a chance to start anew. However, I am deeply concerned about the proposed highway realignment options, especially Alternative 4, which would run directly through many of our homes in the subdivision. This would have a significant and disruptive impact on the families who are already struggling to rebuild their lives. While I truly appreciate the environmental decision to move the highway away from the coastline, I strongly encourage consideration of Alternatives 2 and 3 for our section of the realignment, as they seem to pose less of a threat to the homes and families already established in the area. I would greatly appreciate any information on when and where in-person testimonials or meetings will take place to discuss these important decisions. This is a critical issue for the families in Ukumehame, and we need to have our voices heard as we work toward rebuilding both our homes and our community. Thank you for considering our concerns.

Outlook

Comment Log Submission No. 10

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Tue 12/17/2024 4:34 PM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Robert
Last Name: Santos
Email Address: santosro@hawaii.edu
Join Mailing List: True
Comment:
Can I see the details of the work to be done including their staging area?

From:	no-reply@wspis.com
Sent:	Thursday, January 16, 2025 8:51 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Tara
Last Name: King
Email Address: taradastarra@gmail.com
Join Mailing List: True
Comment:
I really hope you are going to rebuild Weinberg Court .Between PrisonSt.and Dickenson St.. That was the Giant (for Maui) apartment building.I think the address was 161 Honoapiilani Hwy.Naturally offer the original tenants that are still here 1st dibs.I was there since June '08, 15 years.I loved living there.I cared about my neighbors.Irwin Miyamoto was the manager.We had a good relationship with him and his family.My son left a week after the fire,he was so devastated,But I'm still here.I would love to be back in Lahaina,but I couldn't find another apartment.63 apts.altogether.We wait and hope.I still have severe PTSD.I hope you understand.Mahalo,Tara

Comment Log Submission No. 11

From:	no-reply@wspis.com
Sent:	Thursday, January 16, 2025 8:57 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: C-T
Last Name: Folding
Email Address: ctfolding@gmail.com
Join Mailing List: False
Comment:
Can there be a separate biking, walking, golf cart lane, with it's own divider along the side? So many bikers are on Honoapi'ilani Hwy they deserve their own "green lane". Thanks

Comment Log Submission No. 12

From:	no-reply@wspis.com
Sent:	Friday, January 17, 2025 1:33 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Kai
Last Name: Kalani
Email Address: kk808uppah@mailinator.com
Join Mailing List: False
Comment:
The next question is when do we get an escape route, not just a road down from Ulupalakua lookup down exactly 2.2 miles to the road at Makena golf course? Thompson road, aka "Oprah's road" might be a handshake deal for MFD, but what about the rest of us trying to get down the hill for another fire event?

Comment Log Submission No. 13

From: no-reply@wspis.com
Sent: Friday, January 17, 2025 6:20 PM
To: Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject: New Comment from HonoapiilaniHwyImprovements.com

First Name: Darrell
Last Name: Tanaka
Email Address: sunshineorchids@gmail.com
Join Mailing List: False
Comment:
when you build the new highway, please ensure there is ample beach access routes periodically along the shoreline...DOT has recently cut off several of our traditional beach accesses from the McGregor's point to Olowalu and we don't appreciate losing our ability to fish and gather. thank you.

Comment Log Submission No. 14

From: no-reply@wspis.com
Sent: Friday, January 17, 2025 9:54 PM
To: Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject: New Comment from HonoapiilaniHwyImprovements.com

First Name: Raymond
Last Name: Ishii
Email Address: ray38super@gmail.com
Join Mailing List: True
Comment:
Aloha I am Raymond Ishii the current President of the Valley Isle Sports Shooters Club, which is the oldest and largest user of the Ukumehame Firing range. While I fully support moving the existing highway inland there are a number of concerns I have. The routes appear to run makai of the firing lines which we are grateful although a couple are uncomfortable close to the range. The Ukumehame Firing Range is the only legal firing range on the island and is used by thousands of sportsmen's practicing marksmanship and exercising their 2nd Amendment rights. It is also used by Law Enforcement and the military on a regular basis for Firearms and riot control training, Whenever unexploded ordnance is found on Maui, they take it to the range to blow it up. I have been on the range when EOD had blown up everything from IEDs, hand grenades, live artillery shell to 100 pounds of TNT. The preferred alternative route for the bypass is an elevated viaduct that will run makai of the firing ranges, with access to the range and the beach parks will be via the Ukumehame subdivision and back tracking on the existing highway. That section of highway between Ukumehame Beach Park and Papalaua State Wayside park often has waves breaking over the wall and with sea water covering the road. This is the section that is in most the danger to eventually fall into the ocean. Is the state planning to maintain that section of the highway to it existing standards for eternity or will it abandon that section of highway once the ocean claims it, and we will lose access to the range and beach park. To avoid the above, would it be possible to install a turn lane before the viaduct begins on the Pali side to allow direct access to the range and beach parks, plus a merge lane on to the highway for Maalaea bound traffic. That section of highway is protected from the ocean by the Papalaua State Wayside Park. This will give direct access to the public to these areas and allow Emergency Vehicle responding to the area more direct access and quicker response time. It will also allow the state to simply block off the section of the road between Papalaua Park and Ukumehame park once the road is damaged by the ocean. Another concern is the height of the viaduct, one or more of the routes has the entrance road the to range being under the viaduct. Will the viaduct be high enough to allow fire trucks and heavy equipment to drive under it. Due to the constant threat of brush fires on the Pali, and medical calls to the range, the more access Emergency Services has the better. Lastly during construction, will we be be allowed access to the range. Understandably while the viaduct is being constructed, the section under it will be blocked off. Will a temporary road be constructed to allow access under a completed section of the viaduct to ensure access to the public firing range. Thank You for allowing me to comment on this matter. Raymond Ishii President, Valley Isle Sports Shooter Club

Comment Log Submission No. 15

From:	no-reply@wspis.com
Sent:	Monday, January 20, 2025 3:59 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Robert
Last Name: Cole
Email Address: RLC-MauiMetPlan@proton.me
Join Mailing List: False
Comment:
Please do everything possible to make this happen. This is so very important for the island, the community, and the planet. Mahalo, Robert.

Comment Log Submission No. 16

From: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Sent: Monday, January 20, 2025 7:53:03 PM
To: Bents, Jamie <Jamie.Bents@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; La Farga, Paul <paul.lafarga@dot.gov>; Aiu, Pua <pua.aiu@hawaii.gov>
Subject: Fw: [EXTERNAL] West Maui Greenway Connectivity

Ken K Tatsuguchi, PE
Hawaii DOT, Highways Planning
869 Punchbowl St, Rm 301
Honolulu, HI 96813-5097
Ofc # 808-587-1830

From: Dan Dennison <danmountain15@yahoo.com>
Sent: Monday, January 20, 2025 8:50:02 AM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] West Maui Greenway Connectivity

Testimony in Support of the Realignment of Honoapiʻilani Highway with Emphasis on West Maui Greenway Connectivity

Aloha members of the committee,

I am writing to express my support for the proposed 6.5-mile mauka relocation of the Honoapiʻilani Highway. This critical realignment will safeguard a vital transportation corridor that serves as a lifeline for West Maui residents, workers, and visitors, addressing the escalating risks posed by rising sea levels and climate change.

As we work toward a more resilient future, this project is a pivotalstep in West Maui's recovery, resilience, and sustainability.

However, while I support the realignment project, it is essential to highlight a complementary opportunity to strengthen active transportation options and preserve the vision of the West Maui Greenway (WMG). I respectfully urge the Hawai'i Department of Transportation (HDOT) to prioritize the following key elements within this project:

1. Utilization of the Old Highway 30 for West Maui Greenway Segments 6 and 7

○ The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path.
○ Repurposing this scenic corridor as a multi-use trail is a cost-effective solution that supports safe, non-motorized transportation and recreation.
○ This approach would facilitate the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities.

2. Alignment with Climate and Community Goals

○ Incorporating the WMG within the realignment project would align with Maui's commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement.

○ A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness.

3. Community-Driven Design for Long-Term Benefits

○ By transforming the former highway into a recreational and commuting pathway, we can create a lasting community asset that bolsters economic recovery, public health, and local tourism.
○ A dedicated bike and pedestrian trail would provide safe, scenic access to key cultural and natural landmarks, fostering community pride and environmental stewardship.

In summary, while I support the current realignment effort, I respectfully request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. By repurposing this space for non-motorized transportation, we can build a legacy of sustainable infrastructure that meets the needs of future generations and supports West Maui's long-term recovery and growth.

Sincerely,

Dan Dennison
Honolulu

From:	Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Sent:	Thursday, January 23, 2025 9:43 AM
To:	Bents, Jamie; Liebowitz, Peter; La Farga, Paul; Aiu, Pua
Subject:	Fw: [EXTERNAL] Draft EIS for Honoapiilani Hwy. Segments
Attachments:	Testimony in Support of the Realignment of Honoapi'ilani Highway with Emphasis on West Maui Greenway Connectivity.docx

FYI

Ken K Tatsuguchi, PE
Hawaii DOT, Highways Planning
869 Punchbowl St, Rm 301
Honolulu, HI 96813-5097
Ofc # 808-587-1830

From: Donna Clayton <djclaytonmaui@gmail.com>
Sent: Wednesday, January 22, 2025 8:26:56 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] Draft EIS for Honoapiilani Hwy. Segments

Please see attached testimony regarding the subject Draft EIS
Aloha,
Donna Clayton

Testimony in Support of the Realignment of Honoapiʻilani Highway with Emphasis on West Maui Greenway Connectivity

Aloha members of the committee,

I am writing to express my support for the proposed 6.5-mile mauka relocation of the Honoapiʻilani Highway. This critical realignment will safeguard a vital transportation corridor that serves as a lifeline for West Maui residents, workers, and visitors, addressing the escalating risks posed by rising sea levels and climate change. As we work toward a more resilient future, this project is a pivotal step in West Maui's recovery, resilience, and sustainability.

However, while I support the realignment project, it is essential to highlight a complementary opportunity to strengthen active transportation options and preserve the vision of the West Maui Greenway (WMG). I respectfully urge the Hawaiʻi Department of Transportation (HDOT) to prioritize the following key elements within this project:

1. **Utilization of the Old Highway 30 for West Maui Greenway Segments 6 and 7**
    - The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path.
    - Repurposing this scenic corridor as a multi-use trail is a cost-effective solution that supports safe, non-motorized transportation and recreation.
    - This approach would facilitate the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities.
2. **Alignment with Climate and Community Goals**
    - Incorporating the WMG within the realignment project would align with Maui's commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement.
    - A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness.
3. **Community-Driven Design for Long-Term Benefits**
    - By transforming the former highway into a recreational and commuting pathway, we can create a lasting community asset that bolsters economic recovery, public health, and local tourism.
    - A dedicated bike and pedestrian trail would provide safe, scenic access to key cultural and natural landmarks, fostering community pride and environmental stewardship.

In summary, while I support the current realignment effort, I respectfully request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. By repurposing this space for non-motorized transportation, we can build a legacy of sustainable infrastructure that meets the needs of future generations and supports West Maui's long-term recovery and growth.

Thank you for the opportunity to provide testimony. I encourage my fellow community members to participate in this process and advocate for an active transportation network that prioritizes safety, sustainability, and connectivity.

Mahalo nui loa for your consideration.
Donna Clayton/West Maui Greenway Alliance

From:	no-reply@wspis.com
Sent:	Thursday, January 23, 2025 4:01 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Constantine
Last Name: Mittendorf
Email Address: cmittendorf@gmail.com
Join Mailing List: False
Comment:
Testimony in SUPPORT of Honoapiʻilani Highway Realignment – Connect the West Maui Greenway Aloha committee members, I am writing to support realigning the Honoapi'ilani Hwy and expanding the West Maui Greenway. Specifically, I support the proposed 6.5-mile mauka relocation for starters. This realignment is critical and will safeguard a vital transportation corridor. Realignment will mitigate against risks posed by rising sea levels, wildfire, and climate change. This project is a pivotal step in West Maui's recovery, resilience, and sustainability. I urge the Hawaiʻi Department of Transportation (HDOT) to prioritize the following: Use the Old Highway 30 for West Maui Greenway. The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path. Further, it would help diversify transportation and options in case of emergecy. It would be absolutely fantastic for our keiki and future. Folding the former highway into the West Maui Greenway will create a major community asset that bolsters economic recovery, public health, and local quality of life. Please incorporate the WMG within the realignment project. It would align with Maui's commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement. Including the West Maui Greenway into this project will likely also help the Maui County and the State of Hawaii in reaching it's legal obligations regarding climate change and public safety. Mahalo nui loa for your consideration. Constantine Mittendorf January 23, 2025

Comment Log Submission No. 19

From: Jerome Kellner <jerome.kellner@gmail.com>
Sent: Thursday, January 23, 2025 8:16 AM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] proposed 6.5-mile mauka H-Hwy relocation

Aloha members of the committee,

I support the proposed 6.5-mile mauka relocation of the Honoapiʻilani Highway. I urge the Hawaiʻi Department of Transportation to prioritize key elements: Utilization of the Old Highway 30 for West Maui Greenway Segments 6 and 7.The coastal highway is an ideal route for a dedicated bike and pedestrian path. Repurposing this corridor as a multi-use trail supports safe, non-motorized transportation and recreation.This approach facilitates the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities.

A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness.

I support the current realignment effort, and request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route.

Jerome Kellner
200 Hina Ave Apt J7
Kahului, HI 96732

From: no-reply@wspis.com
Sent: Thursday, January 23, 2025 5:47 PM
To: Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject: New Comment from HonoapiilaniHwyImprovements.com

First Name: Richard
Last Name: Gailey
Email Address: richardrgailey@msn.com
Join Mailing List: True
Comment:
To all concerned, The Island is a cultural Entity, moving the Honoapi'iani Highway is within everyone's responsibility to protect this sacred place. Mahalo.

Comment Log Submission No. 21

January 23, 2025 ***Comment Log Submission No. 22***

To: Ken Tatsuguchi, HDOT Project Manager

From: Van Fischer, Olowalu Ranch LLC

Regarding: Honoapiilani Highway Realignment Olowalu Section

Aloha,

My name is Van Fischer and I am writing to you as the owner of lot 19, CPR Unit C in the Olowalu Mauka subdivision. Our property is located just mauka of the existing highway intersection with Luawai Street and wraps around to the back of the existing homes on Olowalu Village Road. We recently purchased this land and are in the planning stages of implementing a farming operation.

The proposed highway location just cuts a small corner of our property and we are relieved that it will not destroy our vision for our farm. That said, we believe there are a number of reasons why a minor adjustment to a small section of the highway moving the route approximately 150-200 feet mauka will improve the safety and flow of traffic and help to avoid valuable natural resources.

As you are aware, most of the subdivision lots in this area have been condominiumized. I have attached a map as exhibit A for your reference.

INTERSECTION ALIGNMENT & SAFETY:

Once the highway is relocated, its intersection with Luawai Street will become the main intersection for access into Olowalu. Due to sea level rise, the existing highway will need to be closed off both north and south of Olowalu so all traffic will come down Luawai Street. Lower Olowalu will become an even more popular destination once the beaches are more secluded and user friendly.

As the preferred Highway route is currently designed, it does not cross Luawai Street at a right angle creating an unsafe intersection for vehicles entering the highway from both the subdivision above the new highway and out of the lower Olowalu village. This intersection absolutely must be signalized with right turn lanes. For vehicles driving up Luawai Street to the highway, there is a bend in the road that will prevent drivers from seeing the traffic that is stopped at the light causing a dangerous situation with lack of safe stopping distance. (See exhibit B)

If the highway is relocated 150-200 feet mauka in this small section as proposed on exhibit B, the highway will cross Luawai Street at a right angle providing maximum sight distance for vehicles using the intersection and more stopping distance for vehicles approaching the intersection from the lower road. It also makes more sense to locate the detention basin next to this intersection as it can be used to collect the water that flows down Luawai Street in heavy rain events.

TOPOGRAPHY:

The topography along a section of the mauka lot line of lot 19 CPR Unit C has a very steep 10-12 foot tall cut bank that runs along that property line in the exact area where the proposed highway crosses that property corner. Due to the continued rise up the hill, building the highway in this spot will result in the sloped bank of the highway will be approximately 20 feet high or more. Simply moving the highway mauka 100 feet or so will eliminate this situation. In the area we are proposing the highway be moved to, the cross section topography is reasonable and will not add cost to the construction of the highway. (See exhibit C)

PROTECTION OF NATUERAL RESOURCES:

Mopua Stream is shown on the Olowalu maps as running straight down mauka to makai crossing through lot 19. It is an open stream from the mauka property line to the existing highway where a culvert crosses the highway into the ocean but is an underground stream above our property. The open section of this stream is teaming with life and well worth protecting. In our exploration of the property, it appears there is also an underground stream channel that runs along the mauka property line of lots 19 and 20. At a point on the Lot 20 mauka property line there is an existing abandoned pump house and moving water is visible in the bottom of the trench. It appears water comes together from multiple directions to this point and then flows underground along our mauka property line into the open section of Mopua Stream. Moving the highway mauka as we propose will protect this valuable water source as we do not know if it is coming from springs or other underground streams. Provisions should also be made for a culvert to be placed under the highway should State wish to re-establish all of Mopua Stream as an open channel in the future. (See exhibit C)

FARM SOIL PROTECTION:

The other consideration in locating the highway should be the protection of quality farming soil. The property above our mauka property line is very rocky and not suitable for farming. It is at best pasture land. All of lot 19 and 20 are comprised of good quality soil and it would be a shame to use any more of that land for the highway than absolutely necessary. The viability of this soil to produce food plants and trees is clearly evidenced by the extensive crops being grown on the two farms by the regenerative farm stand and the two farms and orchards makai of the highway. Moving the highway mauka just the proposed distance protects an additional six or more acres of this soil.

HOUSING:

The route as proposed cuts directly through Lot 19 CPR Unit A and Lot 20 CPR Units A and B and includes a proposed detention basin in that area. As such, the State will need to acquire most if not all of each of these parcel rendering the remainder unbuildable as home sites. These parcels are well suited to local style housing and should be saved if possible. (See exhibit A)

The land just mauka of these parcels consists of an agricultural parcel that is designated as part of the subdivision Greenway Open Space. If the State agrees to move the highway as proposed, the owners of Lot 20 Units A and B would be willing to donate an open space easement on one acre of the Lot 20 CPR Units A and B to offset a portion of the loss of the required greenway at no cost to the State. (See exhibit C)

Moving the highway as suggested will add needed safety features, protect natural resources and reduce the cost of the project. We respectfully request that the State take a through look at all of the benefits this small adjustment will accomplish.

Sincerely,

Van Fischer
808-419-2766
vanfischer@gmail.com


EXHIBIT A
State Proposed Highway Alignment
24 (Walin-Haynes)
22
20
19
17
Luawai St
30

Kalai Pī

480031180000

Lihau

480031150000

Mopua

Our Suggested Route

480031010000

14

480031000000

480031110000

480031140000

480031050000

480031020000

480031130000

Q2

480031120000

480031040000

480031030000

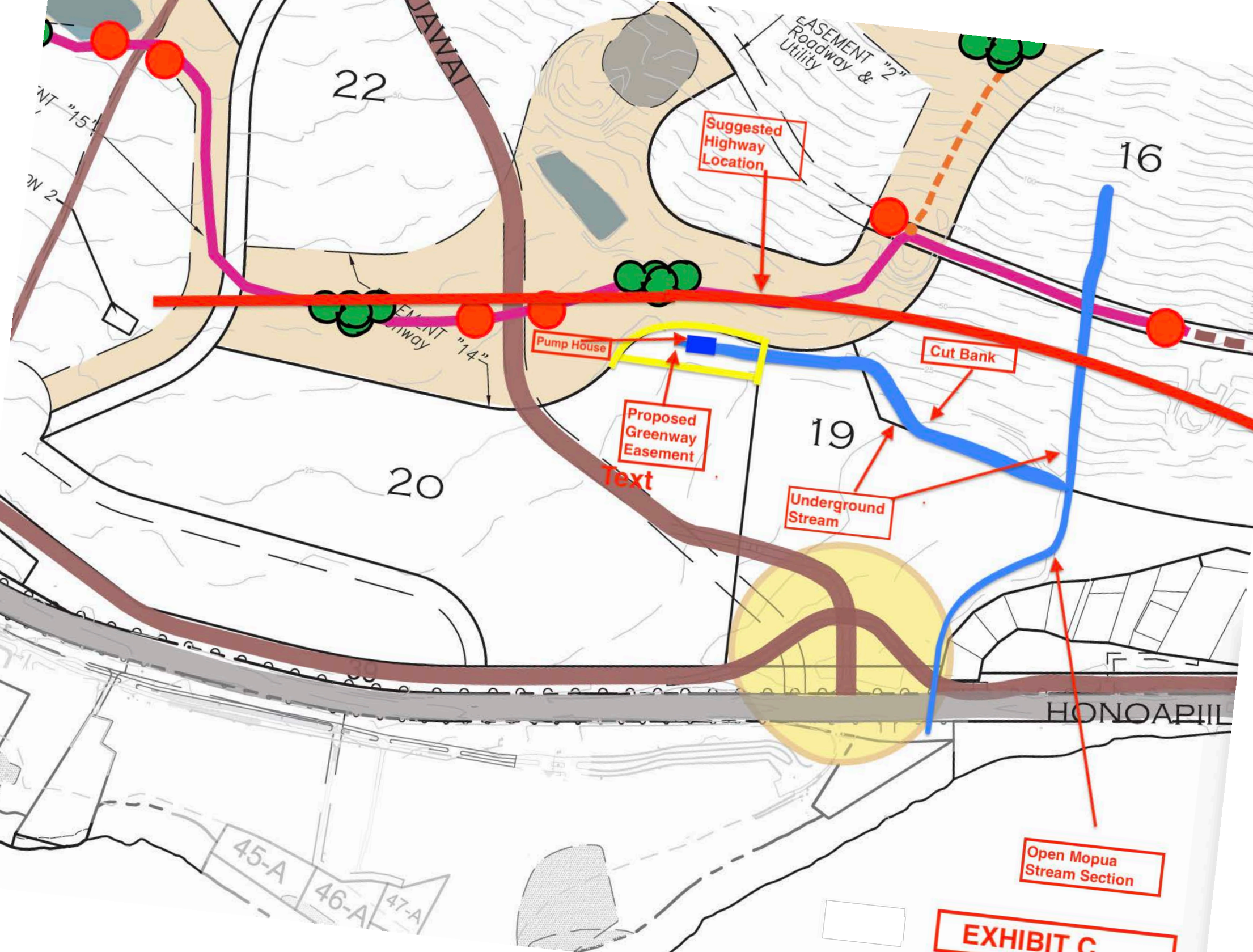
Mā‘alaea

EXHIBIT B

HDOT
Proposed
Route

15

Olowalu


22
16
19
20
Suggested Highway Location
EASEMENT "2" Roadway & Utility
Pump House
Cut Bank
Proposed Greenway Easement
Text
Underground Stream
Open Mopua Stream Section
HONOAPIIL
45-A
46-A
47-A
EXHIBIT C

From: Anna Vinuya <acvinuya1@gmail.com>
Comment Log Submission No. 23
Sent: Thursday, January 23, 2025 5:19:20 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; jasonapotts@gmail.com <jasonapotts@gmail.com>
Subject: [EXTERNAL] A'ole

My name is Anna Nalaniewalu Vinuya-Palakiko

I am the 3rd great grand daughter of James Palakiko and Julia Piko of Olowalu and 3rd great cousin of Lily, James Jr and Maui Palakiko. All 5 are buried on top of Pu'u Kilea in unmarked burials.

My family kuleana aina is in Olowalu Valley and Ukumehame Valley.

Our ohana of this area are; Palakiko,Piko, Pu'upa'a,Ka'awili,Pupuhi, Kaumaka, Kaho'opi'i, and Cason/Napaepae.

It has been brought to my attention that our aina and iwi in Olowalu are in harms way.

I have attempted multiple times to have my ohana burials marked and chained off to help prevent future vandalism because it has happened in past. example: petroglyphs with non prehistoric markings, names carved in the rocks and ceremonial items taken from the burials.

My request is for them to be on the burial protection list and marked so visitors will know that it's protected Native Hawaiian burial site. I also have death certificates proving my family is buried here if needed.

The proposed APE (orange line)

I say A'ole completely to this option because this would expose my family burials and bring more harm and vandalism with the road directly in front of it... there would be little to no protection for them...

The proposed Alternate route #1 (red line)

I say A'ole completely to this option because my grandmother foundation can still be found within the bushes, near the old water tower fronting Naho'oikaika aina just behind the Olowalu General store.
I come to this area to mourn and to honor my deceased kupuna, coming here brings me comfort and helps me to stay grounded.

I say NO to APE and Alternate #1 because they both would disrupt the land of which my family lived and is buried upon and lacks of respect to our people Kanaka Maoli because it offers no protection for our iwi and some of the only untouched aina left here in west maui.

With this plan there is no acknowledgment of the ancient burials, heiau, reef, trees, water ways and uses, taro fields, and animals example: the endangered species ; Nene bird.

In order for me to ever be in agreement. There would have to be many steps taken to ensure all of which I addressed are acknowledged and cared for to the upmost respect as if it was your own families burials and kuleana.

Protections in place for areas that have already been acknowledged to have ancient burials and Ka'iwaloa heiau.

Research and surveyance of the land and water in and around Olowalu before construction using archiologist, historians, and burial council.

Reviewing land patents, LCA land commission awards, survey records, and acknowledging water and land right given to our people from our Ali'i.

Allow for the people of the aina to determine the clarity of the research and surveyance.

Starting with taking care of the people of the land and what is truly important our family history the only thing left for us to hold on too..

In conclusion, the only option that I would be in agreement with is Alternate #2,

* It is far enough away from both my family burials, kuleana land and foundation to provide more distance in hopes to give more protection from unwanted vandalism or desecration.

* It is far enough away to offer protection of archeological sites ae, Petroglyphs, Ka'iwaloa, Lanakila Church, and Japanese burials.

I say NO (A'ole) to APE and Alternate #1.

I look forward to our future conversations to talk about my ohana and Olowalu.

Thank you for your time and understanding of my concerns,

Sincerely,

Anna Nalaniewalu Vinuya-Palakiko
(808)495-6334

Comment Log Submission No. 24

From: maui@hbl.org <maui@hbl.org>
Sent: Thursday, January 23, 2025 3:59:54 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>
Subject: [EXTERNAL] Testimony - Draft Environmental Impact Study proposing the relocation of a 6.5-mile segment of the Honoapi'ilani Highway

Aloha Ken,

Please accept my testimony ref to The Department of Transportation Draft Environmental Impact Study proposing the relocation of a 6.5-mile segment of the Honoapi‘ilani Highway.

Please reach put with any questions.

Mahalo for the opportunity to submit my testimony.

Mahalo!
Saman

Together, we can make our streets safer for everyone.

Saman Dias
Chair Maui Bicycling League
808-209-2542
maui@hbl.org

Make a donation
www.mauibike.org
Follow us on Facebook
Become a MBL member
Add to receive newsletter

January 23, 2024

A Message from the Maui Bicycling League Chair: Help Shape West Maui's Future

Aloha Members of the Committee,

My name is Saman Dias, and I am the Chair of the Maui Bicycling League. I am submitting this testimony to express my strong support for the proposed 6.5-mile mauka relocation of the Honoapiʻilani Highway. This project is critical for safeguarding this vital transportation corridor from the impacts of rising sea levels and climate change, ensuring the safety and connectivity of West Maui's communities.

While I wholeheartedly support the realignment, I urge the Hawaiʻi Department of Transportation (HDOT) to seize this opportunity to enhance active transportation options by incorporating the West Maui Greenway (WMG) into the project. Specifically, I encourage prioritizing the following elements:

- **Utilization of Old Highway 30 for West Maui Greenway Segments 6 and 7**: The existing coastal highway offers an unparalleled opportunity to create a safe, scenic bike and pedestrian path. Repurposing this corridor as a dedicated multi-use trail is a cost-effective and sustainable solution to advance Segments 6 and 7 of the WMG Master Plan, fostering a connected network of paths for the benefit of residents and visitors alike.
- **Alignment with Climate and Community Goals**: Incorporating the WMG into the highway realignment aligns with the Nā Wahine Climate Settlement Agreement and Maui's broader climate resilience goals. A multi-modal transportation corridor featuring pedestrian- and bike-friendly infrastructure reduces emissions, supports healthy lifestyles, and enhances disaster preparedness.
- **Creating a Community-Driven Asset for Long-Term Benefits**: Transforming the former highway into a recreational and commuting pathway will provide a lasting asset for the community, fostering economic recovery, public health, and local tourism. A dedicated bike and pedestrian trail will also preserve access to West Maui's cultural and natural landmarks, reinforcing our shared commitment to sustainability and stewardship.

This project is not only about improving infrastructure but also about building a resilient, sustainable future for West Maui. By integrating the West Maui Greenway into the

realignment project, we can create a legacy that prioritizes safety, connectivity, and environmental responsibility for generations to come.

Mahalo nui loa for considering my testimony. I encourage my fellow advocates and community members to join me in supporting this critical project and ensuring that the West Maui Greenway vision becomes a reality.

Respectfully submitted,

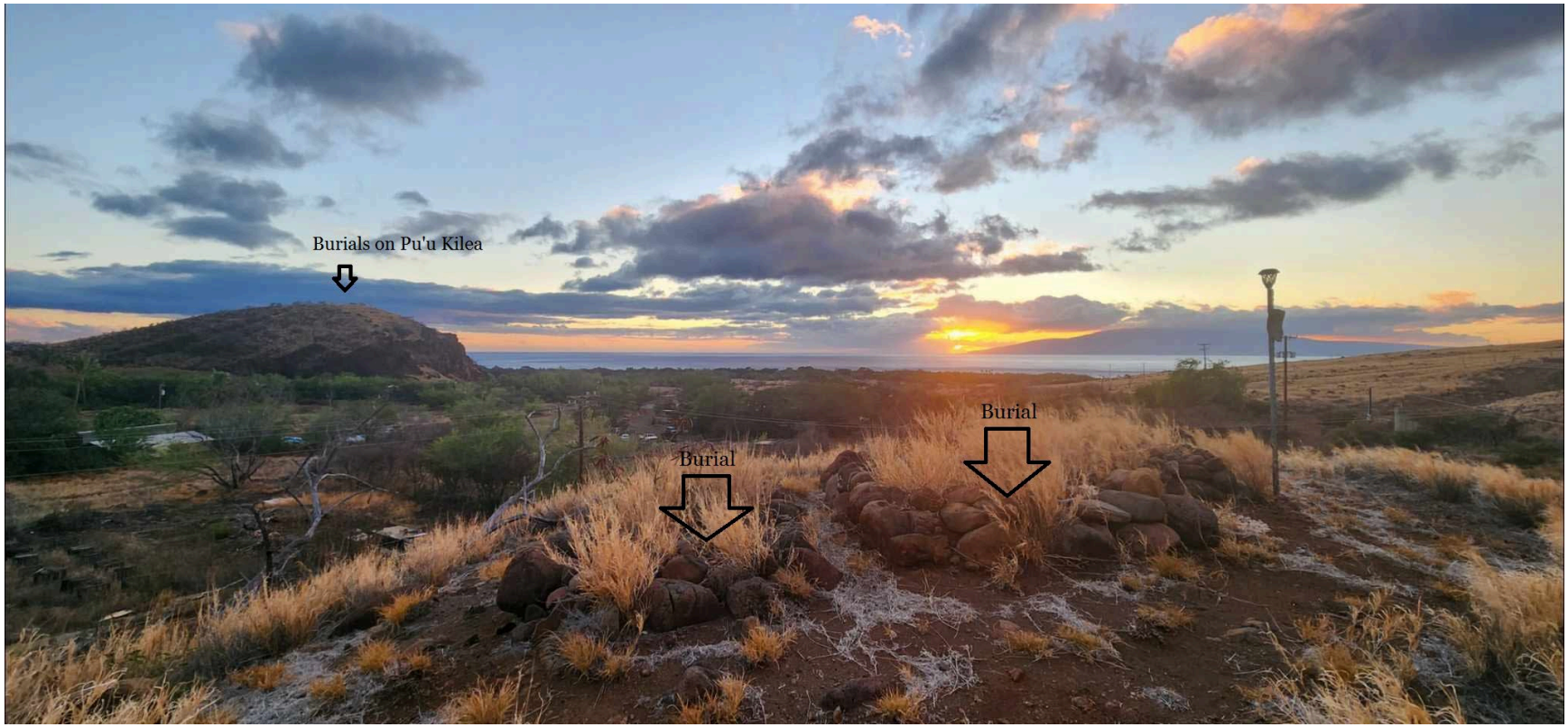
Saman Dias
Chair, Maui Bicycling League

Comment Log Submission No. 25

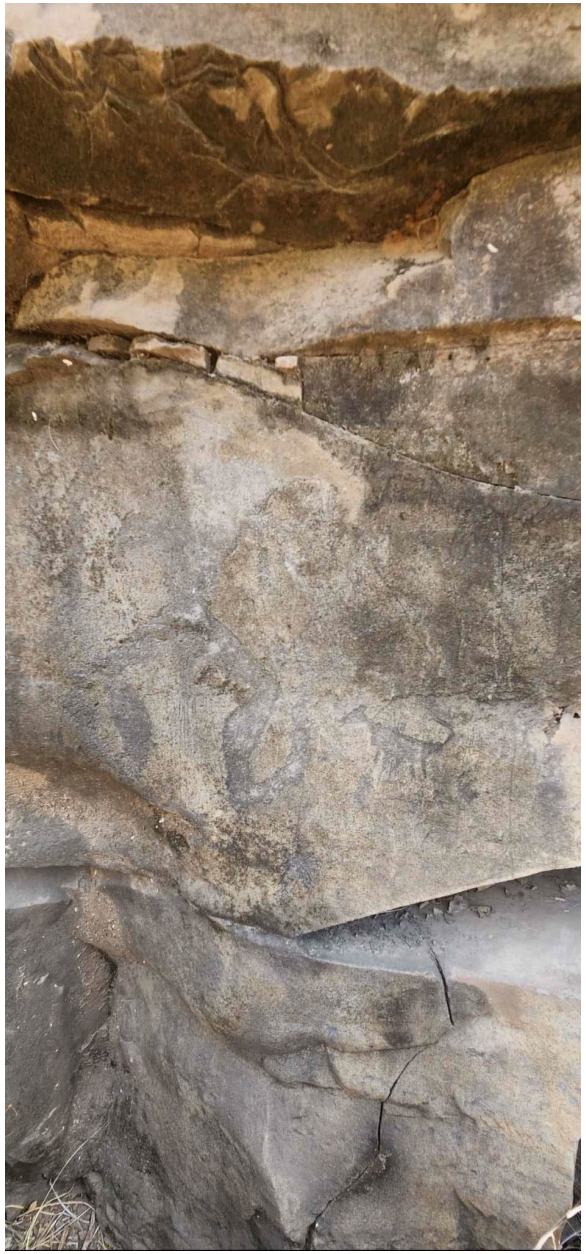
From: J P <jasonapotts@gmail.com>
Sent: Thursday, January 23, 2025 4:12:50 PM
To: J P <jasonapotts@gmail.com>; Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] Olowalu Highway

I'm writing in regards to the proposed hwy improvements in Olowalu/Ukumehame. I oppose all builds except maybe build 1 as long as this build doesn't demolish my wifes 2nd great grandmother's foundation located in the bushes right next to the old water tower/general store. I'm completely against build 4 and your purple project line is going right through the side of Pu'u Kilea and exactly where the oldest petroglyphs are located. (see attached pictures) This area is continually vandalised and we constantly deal with drug addicts sleeping in their cars right in front of the petroglyphs. If you put the main hwy right next to Kilea, more will come. Why not build this closer to the hwy that already exists? If you look up old satellite images from 1950 and compare them to now the land looks exactly the same so what is the purpose of this? Is the land disappearing or is this a ploy to get Olowalu Town eventually passed? We don't want a new hwy that will increase taxes and bring in more millionaires. It's already hard enough to survive and the majority of kanaka have already been forced out due to the high cost of living. Only a few of the original families remain in Olowalu. After all of the attempts for olowalu town and now this hwy why is there still no attempts to protect our ancient sites like Kaiwaloa Heiau,Petroglyphs, and the many burials we have in Olowalu. This includes my wifes ohana that is buried on top of Pu'u KIlea and the burials near our families land in Paumaumau Olowalu. We find people literally standing on top of the burials drinking and watching the sunset and they have no clue what they are standing on or they just don't care. The only thing protected in this area are the mansions and of course they recently put up a new gate blocking our access to the heiau. So I say no to your new hwy and please fix what is already there. Mahalo

Jason
(808)495-6657


Burials on Pu'u Kilea
Burial
Burial


USGS
GS MF
4-50
6315 KODAK AEROGRAPHIC SAFETY
SAFETY
USGS
science for a changing world




Luawai St
Luawai St
Luawai St
Image © 2025 Airbus


Olowalu

From:	no-reply@wspis.com
Sent:	Saturday, January 25, 2025 11:33 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Tavor
Last Name: White
Email Address: Tovarishfriend@aol.com
Join Mailing List: False
Comment:
Maui has a dearth of mixed-use public spaces, other than perhaps beaches, where people can enjoy our beautiful corner of the planet. And, beaches are not conducive for bicycles. Our island is a small place. So, maximizing green areas is essential to our quality of life. I urge you to design and approve plans that do so. Mahalo.

Comment Log Submission No. 26

-----Original Message-----
From: Dave Veldman <Dave@veldmanmorgan.com>
Sent: Saturday, January 25, 2025 3:11 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] Support for the Realignment of the Honuapi'ilani highway

Aloha Ken and members of the Committee!

My name is David Veldman and I live in the Kaanapali Golf Estates. I have recently read about the proposed realignment of the Honoapi’ilani Highway. I am very supportive of the proposed 6.5 mile mauka relocation. As planners for Maui’s future this would seem to me to be an important component to safeguard the critical transportation corridor that serves West Maui. I have also been aware of and fully support the West Maui Greenway vision. This is a terrific opportunity to create a dedicated bike and pedestrian path along the old highway. Repurposing this corridor into a scenic bike and pedestrian corridor is an obvious positive and would help further the vision of the West Maui Greenway.

Thank you for listening.

Dave Veldman
970-567-8130 M

From:	no-reply@wspis.com
Sent:	Tuesday, January 28, 2025 3:18 AM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Allen
Last Name: Surbida
Email Address: allensurbida1003@gmail.com
Join Mailing List: False
Comment:
Aloha, County/state must keep the Ukumehame Firing Range where it is and provide easy access to the only range we have . This project is great but developers should make sure that the range entries are kept open and easy accessible .

Comment Log Submission No. 28

From:	no-reply@wspis.com
Sent:	Tuesday, January 28, 2025 3:49 AM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: John
Last Name: Rafael
Email Address: john808rafael@gmail.com
Join Mailing List: True
Comment:
The Ukumehame Firing Range is the only public range on Maui. It needs to stay open and be easily accessible to the people.

Comment Log Submission No. 29

From:	no-reply@wspis.com
Sent:	Tuesday, January 28, 2025 1:41 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: David
Last Name: Kingdon
Email Address: david@kingdonconsulting.com
Join Mailing List: True
Comment:
I strongly support the reallocation of older, makai sections of the Honoapi‘ilani Highway to be designated, redesigned, and *maintained* as a dedicated multi-use path for running, cycling, and allied activities. This should also include prohibition or limitation of the use of 'e-bikes,' as many of those are capable of traveling at higher or even highway speeds, which could pose a danger to those employing muscle-powered sport and recreation. As a bicycle commuter, distance runner, and a paramedic serving this area of Maui, I can personally and professionally attest that dedicating this portion of H-pi‘ilani for running, cycling and the like will both promote health and improve safety. Further, if well-engineered, maintained, and marketed, this could actually provide a world class 'hike & bike' path for residents and visitors alike. Maui should be actively seeking adventure travelers, who typically have a lower environmental impact, more cultural sensitivity, with the same or even higher economic injects as more sedentary travelers. Thank you for your consideration.

Comment Log Submission No. 30

From: no-reply@wspis.com
Sent: Tuesday, January 28, 2025 10:29 PM
To: Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject: New Comment from HonoapiilaniHwyImprovements.com

First Name: Michele
Last Name: McLean
Email Address: mchouteau@yahoo.com
Join Mailing List: False
Comment:
Please use roundabouts at intersections whenever possible. Mahalo! -Michele.

Comment Log Submission No. 31

From:	no-reply@wspis.com
Sent:	Tuesday, January 28, 2025 10:46 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: cesar
Last Name: martin del campo
Email Address: cesarivangarcia@gmail.com
Join Mailing List: False
Comment:
Support for Honoapiʻilani Highway Improvements Project and Request for Correct Categorization of Parcel 48002115 To: Hawaiʻi Department of Transportation (HDOT) Subject: Public Comment on Honoapiʻilani Highway Improvements Project – Build Alternative 1 Dear Project Team, I am writing to express my support for the Honoapiʻilani Highway Improvements Project and its goals to improve transportation infrastructure while addressing environmental and safety concerns. I appreciate the effort and planning involved in designing a project of this scale to benefit our community. However, I would like to address a critical issue regarding the classification and evaluation of Parcel 48002115, which has been flagged for full acquisition under Build Alternative 1. It is essential that the property's current and planned uses are accurately reflected in the project documentation to ensure an equitable and informed process. 1. Misclassification of Parcel Use The current project documentation categorizes Parcel 48002115 as "not in use," which does not accurately reflect its status. Specifically: The parcel is actively utilized for grass farming operations, supported by established water connections and other agricultural infrastructure. Farming activities are currently underway, generating revenue and contributing to the agricultural economy of the area. Additionally, the lot is being developed with architectural plans for a residential structure to complement its agricultural use. This active farming operation and planned development demonstrate that the parcel is a valuable and productive asset, rather than idle or undeveloped land. If you have any questions, please contact me at (202) 746-0133. Cesar El Toro Zoysia Turf - Maui Grass Farm LLC.

Comment Log Submission No. 32

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

(1) SHORELINE ACCESS - WILL THE COUNTY ALSO BE WORKING CONCURRENTLY TO PROVIDE SHORELINE ACCESS FOR THE 5 MILE STRETCH? WHAT ACCESS TO KUMUKAHI BEACH PARK & THOUSAND PEAKS. [redacted] WILL BE PROVIDED? PARKING?

(2) SQUATTING / HOMELESS. HOW WILL THE STATE/COUNTY ADDRESS SAFETY AND CLEANLINESS ALONG THE SHORELINE? THE ABANDONED PORTION OF CUT MOUNTAIN HAS BECOME OVERTAKEN BY HOMELESS & ABANDONED VEHICLES.

(3) BIKE LANES - HOW WILL CYCLING BE ADDRESSED ALONG THE REALIGNMENT AND ACROSS THE VIADUCT AND BRIDGE STRUCTURES? WILL A SEPARATE BIKE PATH ALONG THE SHORELINE BE BUILT

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Comment Log Submission No. 33

Name:

Address:

City: State: Zip:

Email: Phone:

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*

❑ Newspaper ❑ Email ❑ Community board ❑ Word-of-mouth ❑ Social media
❑ Other: _____

Was the information easy to understand and informative? ❑ Yes ❑ No

Please indicate which of the following best represents you:

❑ Local Resident ❑ Local Business/Industry/Trade Association ❑ Neighborhood Group

❑ Local Non-Profit Organization ❑ National Environmental Organization

❑ Local or State Government ❑ Federal or Tribal Government

❑ Other (please specify) _____

Answering the following questions is optional, but your response will be extremely helpful in ensuring the fairness and equity of HDOT's public involvement process. Submissions will be kept confidential and separate from any personally identifiable information.

What is your race?

❑ Black or African American ❑ American Indian or Alaskan Native ❑ Asian

❑ Hispanic or Latino ❑ White ❑ Native Hawaiian or Other Pacific Islander

❑ I prefer to self-describe: _____

What is the primary language spoken in your home?

❑ English ❑ Hawaiian ❑ Spanish ❑ Tagalog ❑ Vietnamese
❑ Other (Please specify): _____

Was project information translated into other languages appropriately?

❑ Yes ❑ No ❑ Specify: _____

Gender identity:

❑ Man ❑ Woman ❑ Non-binary ❑ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

❑ Yes ❑ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

THANK YOU FOR MAKING THE TIME TO BRING MANY STAKEHOLDERS TOGETHER FROM OLOWALU & UKUMEHAME. IT HAS BEEN VERY INFORMATIVE & POSITIVE HEARING THE AVAILABLE/POTENTIAL ROUTES IN AN EFFORT TO MEDIGATE SEA LEVEL RISE ALONG WITH ENVIRONMENTAL CONCERNS. APPLAUD THE OPEN COMMUNICATION OF YOUR TEAM.

MAHALO

Comment Log Submission No. 34

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name: KATHY KITUNE

Address: 796 OLOWALU VILLAGE ROAD

City: LAHAINA State: HI Zip: 96761

Email: katkitune@gmail.com Phone: 808-357-1096

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*

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☐ Other: _____

Was the information easy to understand and informative? ☐ Yes ☐ No

Please indicate which of the following best represents you:

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☐ Local or State Government ☐ Federal or Tribal Government

☐ Other (please specify) _____

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What is your race?

☐ Black or African American ☐ American Indian or Alaskan Native ☐ Asian

☐ Hispanic or Latino ☐ White ☑ Native Hawaiian or Other Pacific Islander

☐ I prefer to self-describe: _____

What is the primary language spoken in your home?

☑ English ☐ Hawaiian ☐ Spanish ☐ Tagalog ☐ Vietnamese
☐ Other (Please specify): _____

Was project information translated into other languages appropriately?

☑ Yes ☐ No ☐ Specify: _____

Gender identity:

☐ Man ☑ Woman ☐ Non-binary ☐ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

☐ Yes ☑ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

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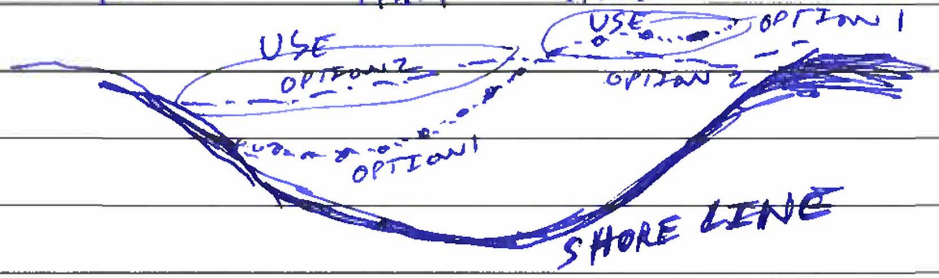
FOR THE OLOWALU PORTION:

USE THE MAUKA/NORTHERN SECTION OF OPTION #1 UNTIL IT CROSSES OPTION #2 THEN PICK UP THAT OPTION



BASICALLY USE THE UPHILL SECTION OF EACH OF 1 & 2 - A MAUKA HYBRID - DONT USE THE MAKAI SECTION OF EITHER

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name: BRANDON HAZLES

Address: 8014 OLOWALU ROAD

City: Lahaina State: HI Zip: 96761

Email: bhazlet@gmail.com Phone: 808 222-3258

Comment Log Submission No. 35

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

Ken.tatsuguchi@hawaii.gov (808)587-1830 www.honoapiilanihwyimprovements.com

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*

☐ Newspaper ☐ Email ☐ Community board ☑ Word-of-mouth ☐ Social media
☐ Other: _____

Was the information easy to understand and informative? ☑ Yes ☐ No

Please indicate which of the following best represents you:

☑ Local Resident ☐ Local Business/Industry/Trade Association ☐ Neighborhood Group

☐ Local Non-Profit Organization ☐ National Environmental Organization

☐ Local or State Government ☐ Federal or Tribal Government

☐ Other (please specify) _____

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What is your race?

☐ Black or African American ☐ American Indian or Alaskan Native ☐ Asian

☐ Hispanic or Latino ☐ White ☐ Native Hawaiian or Other Pacific Islander

☐ I prefer to self-describe: _____

What is the primary language spoken in your home?

☑ English ☐ Hawaiian ☐ Spanish ☐ Tagalog ☐ Vietnamese
☐ Other (Please specify): _____

Was project information translated into other languages appropriately?

☐ Yes ☐ No ☐ Specify: _____

Gender identity:

☐ Man ☐ Woman ☐ Non-binary ☐ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

☐ Yes ☒ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

From past experience, S.H.P.D does not verify accuracy of development information provided. Archeologists and gov't departments are often more in compliance with the wishes of their employers and prospect of future work. For example, Kahoma Village reported no substantial historical importance. However, it was the homestead of David Malo LCA 3702, battle ground between Kamehameha Great and the high chief of Maui and part of the 'Alamihi Fishpond Complex. So, my suggestion is to consult with lineal descendants from each area the road goes thru to ensure pre-contact, iwi, and other cultural historical things are protected and preserved. Least amount of impact to important Hawaiian site Iwi safes memorials for any disturbed iwi within an area.

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Comment Log Submission No. 36

Name: Michele Lincoln

Address: 951 Kaihele Kuu St

City: Lahaina State: HI Zip: 96761

Email: lincolnmichele@yahoo.com Phone: (808) 385-3157

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*

☐ Newspaper ☐ Email ☐ Community board ☒ Word-of-mouth ☐ Social media
☐ Other: _____

Was the information easy to understand and informative? ☒ Yes ☐ No

Please indicate which of the following best represents you:

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☐ Local Non-Profit Organization ☐ National Environmental Organization

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☐ Other (please specify) _____

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What is the primary language spoken in your home?

☒ English ☐ Hawaiian ☐ Spanish ☐ Tagalog ☐ Vietnamese
☐ Other (Please specify): _____

Was project information translated into other languages appropriately?

☐ Yes ☐ No ☐ Specify: _____

Gender identity:

☐ Man ☒ Woman ☐ Non-binary ☐ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

☐ Yes ☒ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

please keep the communities as peaceful & untouched as possible. A highway through a community will change it forever, if possible please create the highway furthest away from infringing on local people. please create a highway that encourages safer & more efficient transportation but discourages further development that does not enhance nor empower local people. ~~[illegible]~~ i hope the money allocated to the highway also gives money to removing ~~the~~ old, poor infrastructure, & ~~[illegible]~~ giving it back to the 'āina & for all locals to take care of & grow. i am confident we can find more creative solutions that empower & center our locals more. federal funding is so hard, but if we need more money to bring better solutions, we pursue more $$ maybe through private? sources.

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name:

Address:

City: State: Zip:

Email: Phone:

Comment Log Submission No. 37

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

Ken.tatsuguchi@hawaii.gov (808)587-1830 www.honoapiilanihwyimprovements.com

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How did you hear about this public meeting? *(please check)*

❑ Newspaper ❑ Email ❑ Community board ❑ Word-of-mouth ❑ Social media
❑ Other: _____

Was the information easy to understand and informative? ❑ Yes ❑ No

Please indicate which of the following best represents you:

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❑ Local Non-Profit Organization ❑ National Environmental Organization

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What is your race?

❑ Black or African American ❑ American Indian or Alaskan Native ❑ Asian

❑ Hispanic or Latino ❑ White ❑ Native Hawaiian or Other Pacific Islander

❑ I prefer to self-describe: _____

What is the primary language spoken in your home?

❑ English ❑ Hawaiian ❑ Spanish ❑ Tagalog ❑ Vietnamese
❑ Other (Please specify): _____

Was project information translated into other languages appropriately?

❑ Yes ❑ No ❑ Specify: _____

Gender identity:

❑ Man ❑ Woman ❑ Non-binary ❑ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

❑ Yes ❑ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

A. SAFETY - WILL INTERSECTIONS HAVE LIGHTING, SIGNALS, EMERGENCY ROADSIDE PHONES ETC.?

B. TRAVEL LANES SURFACE - WILL THE ROAD BE ASPHALT OR PCCP?

C. [redacted] CULTURAL PRESERVATION - WILL ANY MONIES/RESOURCES BE STEERED BACK TO THE COMMUNITIES OF UKUMEHAME AND OLOWALU FOR PRESERVATION AND EDUCATION.

D.

Comment Log Submission No. 38

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name:

Address:

City: State: Zip:

Email: Phone:

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

Ken.tatsuguchi@hawaii.gov (808)587-1830 www.honoapiilanihwyimprovements.com

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How did you hear about this public meeting? *(please check)*

❑ Newspaper ❑ Email ❑ Community board ❑ Word-of-mouth ❑ Social media
❑ Other: _____

Was the information easy to understand and informative? ❑ Yes ❑ No

Please indicate which of the following best represents you:

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❑ Local Non-Profit Organization ❑ National Environmental Organization

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What is your race?

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❑ Hispanic or Latino ❑ White ❑ Native Hawaiian or Other Pacific Islander

❑ I prefer to self-describe: _____

What is the primary language spoken in your home?

❑ English ❑ Hawaiian ❑ Spanish ❑ Tagalog ❑ Vietnamese
❑ Other (Please specify): _____

Was project information translated into other languages appropriately?

❑ Yes ❑ No ❑ Specify: _____

Gender identity:

❑ Man ❑ Woman ❑ Non-binary ❑ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

❑ Yes ❑ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

It would be great if the project included returning the shoreline of the original highway to a more natural state; with minimal shoreline hardening. I'm concerned that giving this responsibility to the County will just result in miles of homeless encampments like those on the old highway when the bypass went in.

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Comment Log Submission No. 39

Name:

Address:

City: State: Zip:

Email: Phone:

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

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☐ Local Non-Profit Organization ☐ National Environmental Organization

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☐ Other (please specify) _____

Answering the following questions is optional, but your response will be extremely helpful in ensuring the fairness and equity of HDOT's public involvement process. Submissions will be kept confidential and separate from any personally identifiable information.

What is your race?

☐ Black or African American ☐ American Indian or Alaskan Native ☐ Asian

☐ Hispanic or Latino ☒ White ☐ Native Hawaiian or Other Pacific Islander

☐ I prefer to self-describe: _____

What is the primary language spoken in your home?

☒ English ☐ Hawaiian ☐ Spanish ☐ Tagalog ☐ Vietnamese
☐ Other (Please specify): _____

Was project information translated into other languages appropriately?

☐ Yes ☐ No ☐ Specify: _____

Gender identity:

☐ Man ☒ Woman ☐ Non-binary ☐ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

☐ Yes ☒ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Form

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

Linda Magallanes

Remove trees - prefer Route 7
There are burials in the area where the preferred is located on the map. Very concerned about burials

Comment Log Submission No. 40

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name:

Address:

City: State: Zip:

Email: Phone:

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*

❑ Newspaper ❑ Email ❑ Community board ❑ Word-of-mouth ❑ Social media
❑ Other: _____

Was the information easy to understand and informative? ❑ Yes ❑ No

Please indicate which of the following best represents you:

❑ Local Resident ❑ Local Business/Industry/Trade Association ❑ Neighborhood Group

❑ Local Non-Profit Organization ❑ National Environmental Organization

❑ Local or State Government ❑ Federal or Tribal Government

❑ Other (please specify) _____

Answering the following questions is optional, but your response will be extremely helpful in ensuring the fairness and equity of HDOT's public involvement process. Submissions will be kept confidential and separate from any personally identifiable information.

What is your race?

❑ Black or African American ❑ American Indian or Alaskan Native ❑ Asian

❑ Hispanic or Latino ❑ White ❑ Native Hawaiian or Other Pacific Islander

❑ I prefer to self-describe: _____

What is the primary language spoken in your home?

❑ English ❑ Hawaiian ❑ Spanish ❑ Tagalog ❑ Vietnamese
❑ Other (Please specify): _____

Was project information translated into other languages appropriately?

❑ Yes ❑ No ❑ Specify: _____

Gender identity:

❑ Man ❑ Woman ❑ Non-binary ❑ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

❑ Yes ❑ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Comment Log Submission No. 41

Phone call with Jonathan Verona

NOTES:
Concern of the possible homeless camp and increase in homeless in the area between the existing Honoapiilani Highway and the Realigned Highway**.**

From: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Sent: Wednesday, January 29, 2025 8:04 PM
To: Bents, Jamie <Jamie.Bents@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; La Farga, Paul <paul.lafarga@dot.gov>; Aiu, Pua <pua.aiu@hawaii.gov>
Subject: FW: Honoapiilani Hwy Imps Project, Info Request

Spoke with Jonathan Verona, he lives in the Olawalu area, think he's a landowner. He wanted information on the project which I emailed him the project site and sent some of the presentation from the hearing. Also, he wanted to provide his comment on the homeless, see below. Thanks,

Ken K Tatsuguchi, PE
Hawaii DOT Planning Branch
869 Punchbowl Street, Room 301
Honolulu, HI 96813-5097
Office phone: 1-808-587-1830

From: Tatsuguchi, Ken
Sent: Wednesday, January 29, 2025 3:01 PM
To: jonnyvaron@gmail.com
Subject: Honoapiilani Hwy Imps Project, Info Request

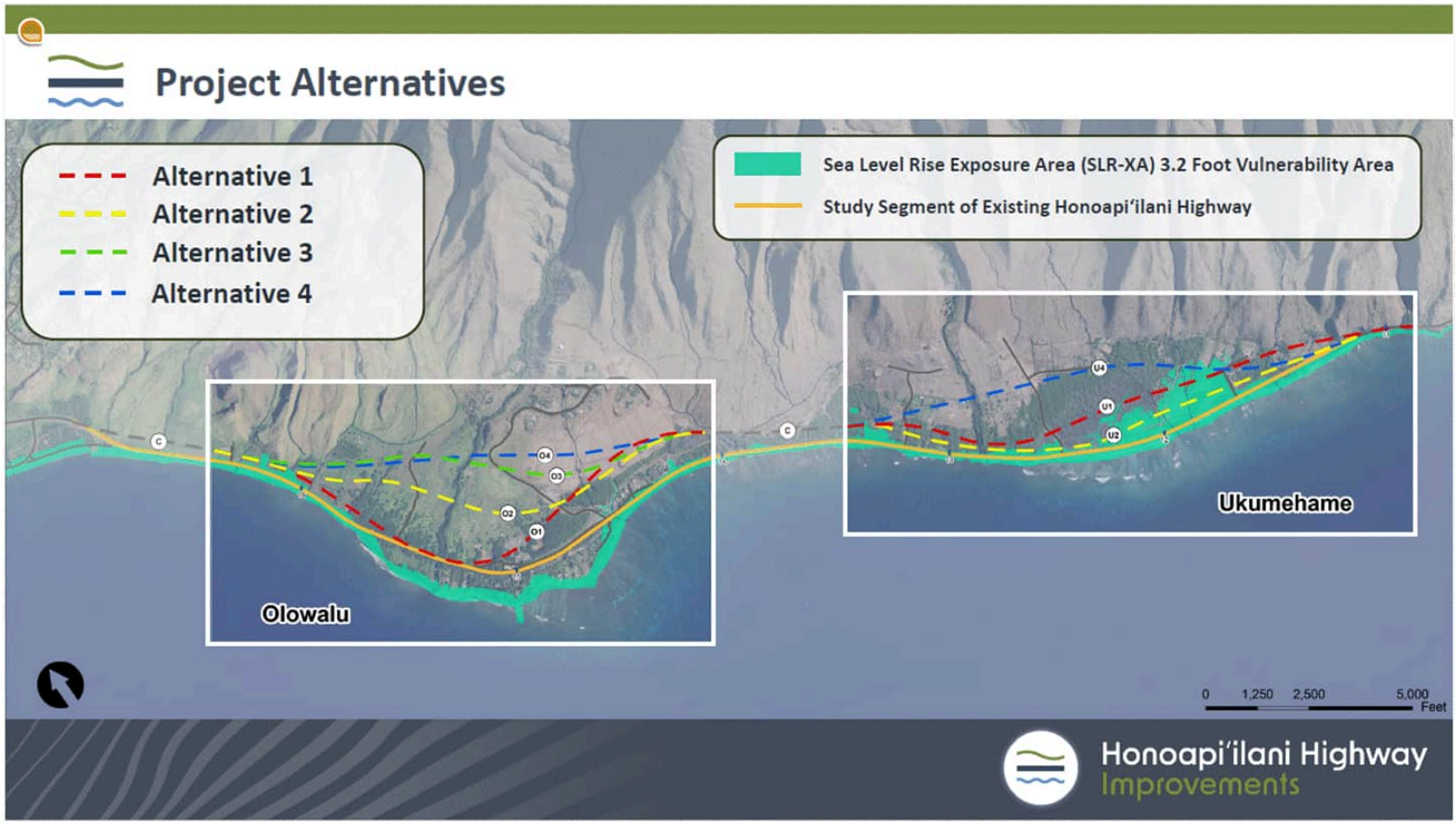
Jonathan,

Following up on our conversation today. Here's the project link to Draft EIS which has the alignments and information you are interested with- honoapiilanihwyimprovements.com

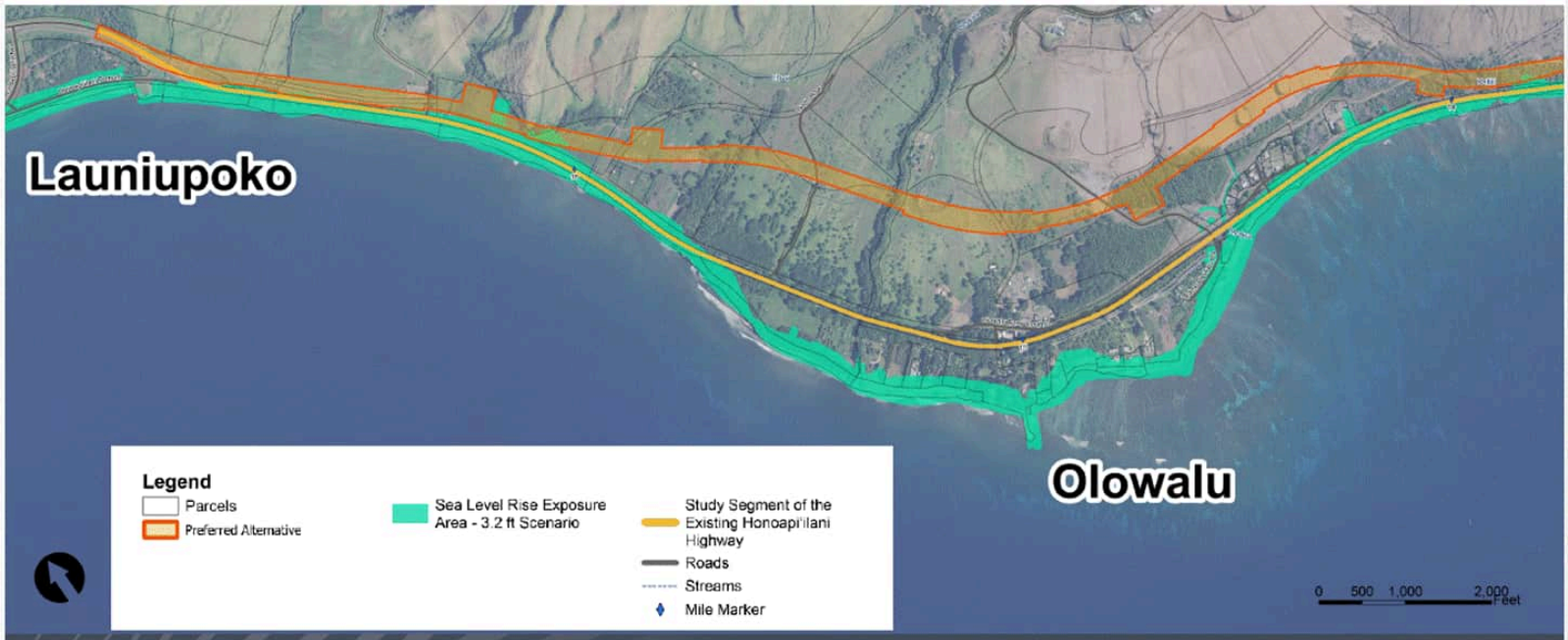
Will provide the project team the your comment on the concern of the possible homeless camp and increase in homeless in the area between the existing Honoapiilani Highway and the Realigned Highway.

And below are some slides from the public hearing that were tied to our conversation.


Project Area
Existing Honoapi'ilani Highway
Landmark
Park
HONOAPI'ILANI HIGHWAY IMPROVEMENTS
This project will look at reliability, resiliency, and safety for roughly 6 miles from Launiupoko to Ukumehame
Ukumehame Firing Range
11
Olowalu Convenience Center
Ukumehame Beach State Park
12
Papalaua Wayside Park
Launiupoko Wayside Park
Awalua Beach
16
14
Kailiili Beach
13
Mā'alaea
Ukumehame
Launiupoko
15
Camp Olowalu
Olowalu Sugar Mill
Olowalu Warf
Olowalu
0 1,250 2,500 5,000 Feet
Honoapi'ilani Highway Improvements


Project Alternatives
Alternative 1
Alternative 2
Alternative 3
Alternative 4
Sea Level Rise Exposure Area (SLR-XA) 3.2 Foot Vulnerability Area
Study Segment of Existing Honoapi'ilani Highway
Olowalu
Ukumehame
0 1,250 2,500 5,000 Feet
Honoapi'ilani Highway Improvements

Olowalu Preferred Alternative (Alternative 2)



Honoapi'ilani Highway Improvements

TOPIC	NO BUILD ALTERNATIVE	BUILD ALTERNATIVE 1	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	PREFERRED ALTERNATIVE
Preliminary Construction Cost Estimates	◕	◑	◑	◑	◑	◑
Land Use and Zoning	◑	◕	●	◕	◕	●
Agriculture and Farmlands	◕	◕	◕	◑	◑	◕
Community Services	◕	●	●	●	●	●
Land Acquisition, Displacement, and Relocation	●	◑	◑	◔	◔	◑
Parklands and Recreational Resources	●	◕	●	●	●	●
Archaeological and Architectural Historic Properties	●	◕	◕	◕	◔	●
Cultural Resources	●	◑	◕	◑	◔	●
Visual and Scenic Character	◑	◑	◕	◑	◔	◕
Water Resources, Wetlands, and Floodplains	○	◕	◕	◕	◕	◕
Flora and Fauna, Endangered Species	◑	◕	◕	◕	◕	◕
Geology, Soils, and Natural Hazards	◔	◕	●	●	●	●
Coastal Zone Management/Hawai'i Special Management Areas	○	◕	●	●	●	●
Climate Change and Sea Level Rise	○	●	●	●	●	●
Transportation	○	◕	●	●	●	●
Air Quality and Energy	◕	●	●	●	●	●
Noise	◑	●	●	●	◔	●
Infrastructure and Utilities	◕	●	●	●	●	●
Hazardous Materials	●	◕	●	●	●	●
Environmental Justice	◕	●	●	●	●	●
OLOWALU OVERALL ASSESSMENT	◔	◕	●	◕	◑	●

● BEST
◕ GOOD
◑ NEUTRAL
◔ POOR
○ WORST

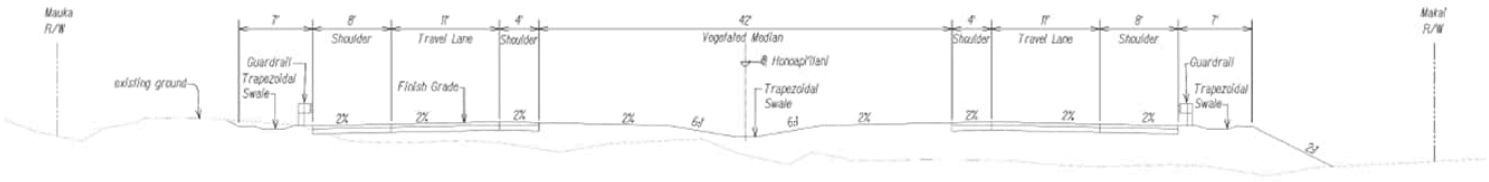
Alternative Impact Evaluation and Screening

Honoapi'ilani Highway Improvements

Design Elements

Basic Design Elements Include:

- 45 MPH posted speed limit
- 11-ft wide travel lanes
- Paved shoulders (4-ft min. at median, 8-ft outside)
- Guardrails where appropriate
- Wide vegetated medians (for improved safety and stormwater management)
- Acceleration / deceleration lanes at intersections
- Infiltration/detention ponds

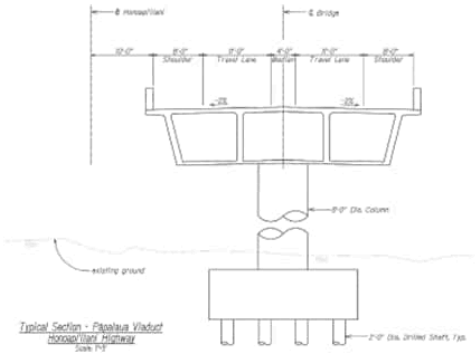


Primary Typical Section - Two Lane with Wide Vegetated Median
Honoapi'ilani Highway
Scale 1"=5'

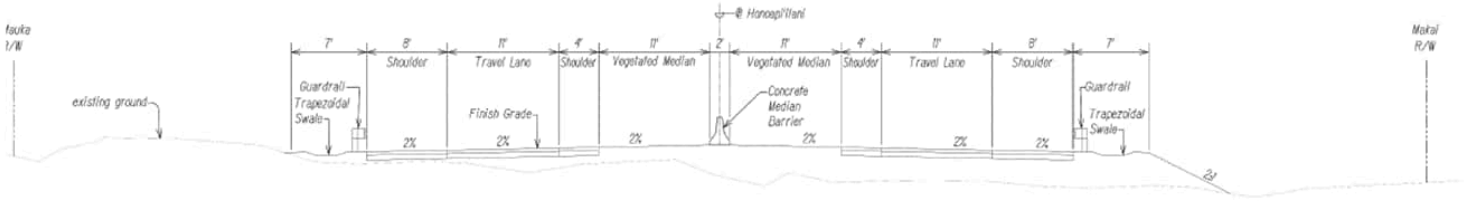
Design Elements

Variations in Design Elements Include:

- Narrower medians (to reduce footprint for preservation of archaeological and historic resources)
- Viaduct in Ukumehame (to span over sedimentation pond and wetland areas)
- Street lighting only at intersections



Typical Section - Pitpalaua Viaduct
Honoapi'ilani Highway
Scale 1"=5'



Pinch Point Typical Section - Two Lane Narrow Vegetated Median
Honoapi'ilani Highway
Scale 1"=5'

The Draft EIS comment deadline is February 24th. Mahalo,

Ken K Tatsuguchi, PE
Hawaii DOT Planning Branch
869 Punchbowl Street, Room 301
Honolulu, HI 96813-5097
Office phone: 1-808-587-1830

COUNTY COUNCIL
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www.MauiCounty.us

Comment Log Submission No. 42

January 28, 2025

Federal Highway Administration
Hawaii Division
Attention: Richelle Takara
Division Administrator
Box 50206
300 Ala Moana Blvd., Room 3-229
Honolulu, HI 96850
Richelle.Takara@dot.gov

Hawai'i Department of Transportation
Highways Division
Attention: Genevieve Sullivan
869 Punchbowl Street, Room 301
Honolulu, HI 96813
Genevieve.h.sullivan@hawaii.gov

RE: A Department of Transportation, Federal Highway Administration, Environmental Impact Statement for the Honoapi'ilani Highway Improvements Project

Aloha Ms. Takara and Ms. Sullivan,

I am writing to provide comments pertaining to the Notice of Intent to Prepare an Environmental Impact Statement regarding potential improvements to the Honoapi'ilani Highway (State Route No. 30) between milepost 11 in the vicinity of Papalaua Wayside Park in Ukumehame and milepost 17 in Launiupoko,

As stated in the Draft Notice of Intent, "Improvements are needed to provide a reliable transportation facility that would not be inundated by the predicted 3.2-foot sea level rise and undermined by coastal erosion."

I firmly believe and **strongly support** the Honoapi'ilani Highway's proposed 6.5-mile mauka relocation as a necessary step in improving the safety and resilience of West Maui's transportation system. The Federal Highway Administration began discussions on realignment, as early as June 2007. Since then, no advancements have been made. Now, swift action is needed to safeguard this essential highway from the growing threats posed by climate change and sea level rise, as well as ensure continuous connectivity for locals and tourists, who depend on this route for work and leisure.

Furthermore, I would like to encourage the Departments to think about implementing active transportation choices, particularly the West Maui Greenway (WMG). Developed in 2022 as a vision for a proposed 25-mile

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www.MauiCounty.us

multipurpose path that would connect Ukumehame to Lipoa Point, it can be viewed as a strategy to increase the region's resilience through sustainable, multimodal transportation for present and future generations.

As such, I respectfully urge the Hawai'i Department of Transportation (HDOT) to prioritize the following key WMG elements within the project:

1. **Use of (Old) State Route 30 for Segments 6 and 7**

   - Segments 6 and 7 (the southernmost sections, from Lahaina Pali Trailhead to Lauiniupoko Beach Park) of the WMG are best served by the current (Old) State Route 30 since it could offer a dedicated bike and pedestrian path.

   - Transforming this scenic road into a continuously connected, pedestrian and bike-friendly corridor, would promote safe, nonmotorized travel and recreation, that also serves as a cost-effective means of connecting West Maui communities.

2. **Conformity with Climate and Community Goals**

   - Including the WMG in the highway realignment project is in line with Maui's commitment to climate resilience, as well as meets the *Navahine v. Hawai'i Department of Transportation et al.*, Climate Settlement Agreement (2024), which requires the state to develop a plan to drastically reduce greenhouse gas emissions from the transportation sector with the goal of Zero Emissions by 2045.

   - This multifunctional trail also promotes healthy lifestyles and augments disaster preparedness by serving as an evacuation route.

3. **Designed by the Community for Long-Term Benefits**

   - Transforming Honoapi'ilani Highway into a recreational and commuting pathway would create a lasting

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www.MauiCounty.us

community asset that boosts economic recovery, tourism, and public health.

- A designated bike and pedestrian path would promote environmental stewardship and community pride by offering secure, picturesque access to important natural and cultural landmarks.

As part of HDOT's broader goal to repair the coastal highway network from Māʻalaea to north of Lahaina, the Honoapiʻilani Highway Improvements Project will bring much-needed service dependability and resilience. This project also offers a rare chance to incorporate the West Maui Greenway as a crucial component of this reconstruction.

The August 2023 wildfires has forced our community to rethink present and future disaster recovery and infrastructure planning. Conversion of the former highway into a cycling and pedestrian path, as well as an evacuation route, will shape a legacy of sustainable infrastructure that will benefit West Maui for many years to come.

I respectfully ask for your consideration of incorporating the West Maui Greenway into the Honoapiʻilani Highway Improvement Project, and I look forward to seeing this move forward with these important elements included.

Thank you for your time and consideration of this critical matter. Please feel free to contact me at: Tamara.Paltin@mauicounty.us or (808) 295-2967.

Me ka ʻoiaʻiʻo,

Tamara A. M. Paltin

Tamara Paltin
Councilmember

The following submissions were given during the virtual public hearing as Zoom Testimony. See DIES Public Hearing Transcripts for the transcript of these comments.

Comment Log Submission No. 43

Comment Log Submission No. 44

Comment Log Submission No. 45

Comment Log Submission No. 46

Comment Log Submission No. 47

Comment Log Submission No. 48

From:	no-reply@wspis.com
Sent:	Monday, February 10, 2025 4:24 AM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Daniel
Last Name: Ornelas
Email Address: Devictimized@gmail.com
Join Mailing List: False
Comment:
Please consider making the road 4 lanes when built to allow better flow of traffic for those that commute to the west side for work. Impatient motorists stuck behind those driving below the speed limit routinely drive aggressively through this section in order to pass clusters of slower drivers. Building 2 lanes either direction will allow these motorists to safely pass slower drivers and reduce congestion through Lahaina.

Comment Log Submission No. 49

From:	no-reply@wspis.com
Sent:	Thursday, February 13, 2025 10:27 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Elaine
Last Name: Baker
Email Address: Elaine.Baker@co.maui.hi.us
Join Mailing List: False
Comment:
Routing across any portion of the closed Olowalu Landfill should be avoided so that buried waste is not exposed to the environment. Routing across any portion of the Olowalu Recycling and Refuse Center will result in a reduction of solid waste services for West Maui.

Comment Log Submission No. 50

From: no-reply@wspis.com
Sent: Wednesday, February 12, 2025 10:24 PM
To: Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject: New Comment from HonoapiilaniHwyImprovements.com

First Name: Saman
Last Name: Dias
Email Address: maui@hbl.org
Join Mailing List: False
Comment:
February 12, 2025 Revised Testimony to HDOT and FHWA on Honoapi‘ilani Highway Improvements & West Maui Greenway Integration _____ To: Hawaii Department of Transportation (HDOT) Federal Highway Administration (FHWA) Subject: Integration of the West Maui Greenway (WMG) into the Honoapi‘ilani Highway Realignment & Compliance with ACT 214 Aloha, I am writing to provide testimony on the Honoapi‘ilani Highway (State Route 30) realignment and strongly urge HDOT and FHWA to incorporate the West Maui Greenway (WMG) as part of this project. This realignment presents an unprecedented opportunity to enhance multimodal transportation, improve emergency evacuation infrastructure, and align with long-standing but unfulfilled state policies—most notably Act 214 (2007), which mandated the use of cane haul roads for emergency evacuation. 1. HDOT’s Failure to Implement Act 214 – A Costly Oversight The 2007 Act 214 directed HDOT to incorporate cane haul roads into emergency evacuation planning. Yet over 100 lives were lost in the August 2023 Lahaina fire—many of which could have been prevented had these evacuation routes been open and accessible. • The Honoapi‘ilani Highway realignment must correct this tragic failure by formally incorporating cane haul roads as emergency evacuation routes. • HDOT must negotiate with private landowners for right-of-way access and develop permanent emergency routes as part of this highway realignment. • Failure to integrate emergency evacuation routes now would be a continuation of HDOT’s past neglect and put West Maui residents at continued risk. 2. West Maui Greenway as a Vital Multimodal Corridor & Emergency Route The West Maui Greenway (WMG), identified in the Hele Mai Maui Legacy Projects, is a critical component of West Maui’s future transportation network. This project is already funded in part and aligns with state and federal transportation priorities. • Use of (Old) State Route 30 for WMG’s Segment 6: o The realigned Honoapi‘ilani Highway creates a perfect opportunity to repurpose the old highway as a dedicated bike/pedestrian corridor. o This cost-effective solution promotes safe, non-motorized travel while doubling as an emergency evacuation route for residents and visitors. • Conformity with Climate & Community Goals: o Navahine Settlement Agreement (2024): HDOT must drastically reduce transportation-sector greenhouse gas emissions and prioritize multimodal solutions. o Act 131 & Complete Streets Policy: State law mandates that new highways must be bike-friendly and accommodate pedestrians. The WMG achieves this. 3. Current Funding & Alignment with Federal/State Priorities The WMG has secured substantial funding, and it is listed as a priority in multiple state and federal programs: ✅ $15 million RAISE Grant – Federal funds awarded for WMG implementation. ✅ Inclusion in the Statewide Transportation Improvement Program (STIP) – Recognized as a priority transportation project for Hawai‘i. ✅ Hele Mai Maui MPO Plan & Hawai‘i Bike Plan – Officially designated as a core component of Maui’s transportation future. With this funding in place, HDOT must act immediately to integrate WMG into the highway realignment. Delays in implementation put these

funds at risk. 4. A Safer Highway for Bicyclists & Pedestrians The new Honoapi‘ilani Highway must not repeat past mistakes—it must be designed with safety in mind: • Separated Bike Lanes & Pedestrian Crossings: o The highway realignment must include protected bicycle infrastructure, in accordance with the Complete Streets Policy & Act 131. o Safe pedestrian crossings must be prioritized to reduce conflict with vehicle traffic. • Disaster Preparedness Through Smart Design: o The WMG serves dual purposes—as a transportation corridor and evacuation route in case of future wildfires or climate-related disasters. Conclusion & Urgent Request for Action The Honoapi‘ilani Highway realignment is not just a highway project—it is a life-saving infrastructure upgrade. ✅ HDOT must implement the long-overdue Act 214 (2007) by formally incorporating cane haul roads as emergency evacuation routes. ✅ WMG’s Segment 6 must be integrated into the old highway to maximize the state’s investment in safe, sustainable transportation. ✅ The new highway must be bike-friendly, pedestrian-accessible, and aligned with state & federal multimodal goals. This is a critical moment for West Maui. HDOT and FHWA cannot afford to overlook these urgent priorities. I urge immediate action to ensure no more lives are lost due to lack of proper evacuation routes. Mahalo for your time and consideration. Respectfully submitted, Saman Dias Chair, Maui Bicycling League Together, we can make our streets safer for everyone. Saman Dias Chair Maui Bicycling League 808-209-2542 maui@hbl.org www.mauibike.org

Comment Log Submission No. 51

Comment Log Submission No. 51

From: maui@hbl.org <maui@hbl.org>
Sent: Wednesday, February 12, 2025 5:28:22 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Cc: Saman Dias - Maui Bicycling League <Maui@hbl.org>
Subject: [EXTERNAL] Updated testimony

Aloha Ken,

Pls. accept my updated testimony.

Mahalo!
Saman

Together, we can make our streets safer for everyone.
Saman Dias
Chair Maui Bicycling League
808-209-2542
maui@hbl.org
Make a donation
www.mauibike.org/
Follow us on Facebook
Become a MBL member
Add to receive newsletter

February 12, 2025

Revised Testimony to HDOT and FHWA on Honoapi‘ilani Highway Improvements & West Maui Greenway Integration

---

To:
Hawaii Department of Transportation (HDOT)
Federal Highway Administration (FHWA)

Subject: Integration of the West Maui Greenway (WMG) into the Honoapi‘ilani Highway Realignment & Compliance with ACT 214

Aloha,

I am writing to provide testimony on the Honoapi‘ilani Highway (State Route 30) realignment and strongly urge HDOT and FHWA to incorporate the **West Maui Greenway (WMG)** as part of this project. This realignment presents an **unprecedented opportunity** to enhance multimodal transportation, improve emergency evacuation infrastructure, and align with **long-standing but unfulfilled** state policies—most notably **Act 214 (2007),** which mandated the use of cane haul roads for emergency evacuation.

1. HDOT’s Failure to Implement Act 214 – A Costly Oversight

The **2007 Act 214** directed HDOT to incorporate cane haul roads into **emergency evacuation planning.** Yet over **100 lives were lost** in the August 2023 Lahaina fire—many of which could have been **prevented** had these evacuation routes been **open and accessible.**

- The **Honoapi‘ilani Highway realignment** must correct this **tragic failure** by formally incorporating **cane haul roads as emergency evacuation routes.**
- HDOT must **negotiate with private landowners** for right-of-way access and develop **permanent emergency routes** as part of this highway realignment.
- **Failure to integrate emergency evacuation routes now** would be a continuation of HDOT’s past neglect and put West Maui residents at continued risk.

2. West Maui Greenway as a Vital Multimodal Corridor & Emergency Route

The **West Maui Greenway (WMG),** identified in the **Hele Mai Maui Legacy Projects**, is a critical component of West Maui's future transportation network. This project is already funded in part and aligns with **state and federal transportation priorities.**

- **Use of (Old) State Route 30 for WMG's Segment 6:**
  - The realigned **Honoapi'ilani Highway creates a perfect opportunity** to repurpose the old highway as a dedicated bike/pedestrian corridor.
  - This **cost-effective** solution promotes **safe, non-motorized travel** while doubling as an **emergency evacuation route** for residents and visitors.
- **Conformity with Climate & Community Goals:**
  - **Navahine Settlement Agreement (2024):** HDOT must drastically reduce **transportation-sector greenhouse gas emissions** and prioritize multimodal solutions.
  - **Act 131 & Complete Streets Policy:** State law mandates that **new highways must be bike-friendly and accommodate pedestrians.** The **WMG achieves this.**

3. Current Funding & Alignment with Federal/State Priorities

The WMG **has secured substantial funding**, and it is listed as a priority in multiple state and federal programs:

✅ **$15 million RAISE Grant** – Federal funds awarded for WMG implementation.
✅ **Inclusion in the Statewide Transportation Improvement Program (STIP)** – Recognized as a priority transportation project for Hawai'i.
✅ **Hele Mai Maui MPO Plan & Hawai'i Bike Plan** – Officially designated as a **core component of Maui's transportation future.**

With this funding in place, HDOT must act **immediately** to integrate WMG into the highway realignment. **Delays in implementation put these funds at risk.**

4. A Safer Highway for Bicyclists & Pedestrians

The new Honoapi'ilani Highway must **not repeat past mistakes**—it must be designed with safety in mind:

- **Separated Bike Lanes & Pedestrian Crossings:**
  - The highway realignment **must include protected bicycle infrastructure**, in accordance with the **Complete Streets Policy & Act 131.**
  - Safe pedestrian crossings must be **prioritized** to reduce conflict with vehicle traffic.
- **Disaster Preparedness Through Smart Design:**
  - The **WMG serves dual purposes**—as a transportation corridor and **evacuation route** in case of future wildfires or climate-related disasters.

Conclusion & Urgent Request for Action

The **Honoapi‘ilani Highway realignment is not just a highway project—it is a life-saving infrastructure upgrade.**

✅ **HDOT must implement the long-overdue Act 214 (2007) by formally incorporating cane haul roads as emergency evacuation routes.**
✅ **WMG’s Segment 6 must be integrated into the old highway to maximize the state’s investment in safe, sustainable transportation.**
✅ **The new highway must be bike-friendly, pedestrian-accessible, and aligned with state & federal multimodal goals.**

This is a **critical moment for West Maui.** HDOT and FHWA **cannot afford to overlook these urgent priorities.** I urge immediate action to ensure **no more lives are lost due to lack of proper evacuation routes.**

Mahalo for your time and consideration.

Respectfully submitted,

Saman Dias
Chair, Maui Bicycling League

Together, we can make our streets safer for everyone.
Saman Dias
Chair Maui Bicycling League
808-209-2542
maui@hbl.org
www.mauibike.org

The following submissions were given during the public hearing as in-person verbal testimony. See DIES Public Hearing Transcripts for the transcript of these comments.

Comment Log Submission No. 52 - Kellee Emmerich

Comment Log Submission No. 53 - Brad Emmerich

Comment Log Submission No. 54 - Raymond Ishii

Comment Log Submission No. 55 - David McPherson

Comment Log Submission No. 56 - Jason Wolford

Comment Log Submission No. 57 - Van Fischer

Comment Log Submission No. 58 - Nick Nielson

Comment Log Submission No. 59 - Malihini Keahi

Comment Log Submission No. 60 - Ms. Keele

Comment Log Submission No. 61 - Victoria Kaluna-Palafox

Comment Log Submission No. 62 - Linda Nahina Magallanes

Comment Log Submission No. 63 - Mr. Kaluna Palafox

Comment Log Submission No. 64 - Ms. Felice

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1111 Broadway, Suite 1200
Oakland, CA 94607

February 18, 2025

IN REPLY REFER TO:
ER 25/0010
4111

Comment Log Submission No. 65

Ken Tatsuguchi
HDOT Highways Planning Branch
869 Punchbowl Street, Room 301
Honolulu, HI 96813

Subject: U.S. Department of the Interior Comments – DRAFT Section 4(f) Evaluation for *Honoapi'ilani Highway Improvements Project West Maui: Ukumehame to Launiupoko, December 2024*

Dear Ken Tatsuguchi:

The U.S. Department of the Interior (Department), as required by the Department of Transportation Act of 1966 (49 U.S.C. §303 and 23 U.S.C. §138), has reviewed the December 2024 DRAFT Section 4(f) Evaluation for *Honoapi'ilani Highway Improvements Project West Maui: Ukumehame to Launiupoko*.

The Hawai'i Department of Transportation (HDOT) proposes to build a new six-mile alignment of the Honoapi'ilani Highway to provide a reliable transportation facility in West Maui and reduce the highway's vulnerability to coastal hazards. Several areas with archaeological resources in Olowalu and Ukumehame were evaluated for potential impacts by one or more Build Alternatives. A draft Programmatic Agreement between HDOT and the Hawai'i State Historic Preservation Division includes protocols to avoid, minimize, or mitigate adverse effects to archaeological historic properties and burials. The 4(f) evaluation concludes that the Build Alternatives will not have direct, temporary, or constructive use of 4(f) resources within the Olowalu Sugar Plantation Historic District or on individually eligible and contributing resources in Olowalu. In Ukumehame, there are no eligible architectural historic properties - i.e., no 4(f) protected historic resources.

The Department, through the National Park Service (NPS), concurs with a de minimis finding, that the project will have no adverse effects on any Section 4(f) properties within the project area. If you have specific questions related to our comments, please contact Danette Woo Nolan at Danette_Woo@nps.gov. For all other questions, please contact me at Viktoriya_Sirova@ios.doi.gov.

Sincerely,

VIKTORIYA SIROVA
Digitally signed by VIKTORIYA SIROVA
Date: 2025.02.18 11:41:55 -08'00'

Viktoriya Sirova
Regional Environmental Officer

Electronic distribution: honoapiilanieis@online.wspis.com, ken.tatsuguchi@hawaii.gov

cc: Roxanne Runkel, National Park Service: Roxanne_Runkel@nps.gov
Danette Woo, National Park Service: Danette_Woo@nps.gov

JOSH GREEN, M.D.
GOVERNOR OF HAWAI'I
KE KIA'ĀINA O KA MOKU'ĀINA 'O HAWAI'I

KENNETH S. FINK, MD, MGA, MPH
DIRECTOR OF HEALTH
KA LUNA HO'OKELE

STATE OF HAWAII
DEPARTMENT OF HEALTH
KA 'OIHANA OLAKINO
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File:
24-288A CAB

July 3, 2024

Comment Log Submission No. 66

MEMORANDUM

TO: Agencies and Project Owners

FROM: MARIANNE ROSSIO, P.E., CHIEF
Clean Air Branch

SUBJECT: Clean Air Branch Standard Project Comments

This memo is provided for your information and sharing. You are encouraged to share this memo with your project partners, team members, and appropriate personnel.

The Department of Health (DOH), Clean Air Branch (CAB), will no longer be responding directly to requests for comments on the following documents (including pre-consultation, early consultation, preparation notice, draft, final, addendums, and/or supplements):

- Environmental Impact Statements (EIS)
- Environmental Assessments (EA)
- Anticipated Finding of No Environmental Significant Impacts (AFONSI)
- Conservation District Use Applications (CDUA)
- Special Management Area Permits (SMAP)

For agencies or project owners requiring DOH-CAB comments on one or more of these documents, please utilize the DOH-CAB Standard Comments below regarding your project's responsibilities to maintain air quality and any necessary permitting. DOH-CAB Standard Comments are also available on the DOH-CAB website located at: https://health.hawaii.gov/cab/files/2024/07/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-July_2024.pdf.

If you have any questions, please the Clean Air Branch at (808) 586-4200.

CH:rkb

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health
July 3, 2024

All project activities shall comply with Hawaii Administrative Rules (HAR), Chapter 11-59 and 11-60.1.

If your proposed project:

Requires an Air Pollution Control Permit

- You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.
- Permit application forms can be found here: https://health.hawaii.gov/cab/permit-application- forms/

Has the potential to generate fugitive dust

- You must reasonably control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near existing residences, businesses, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.
- Construction activities must comply with the provisions of Hawaii Administrative Rules, §11- 60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, it is strongly recommended that buffer zones be established, wherever possible, in order to alleviate potential dust concerns.
- You must provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:
    - Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
    - Providing an adequate water source at the site prior to start-up of construction activities;
    - Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
    - Minimizing airborne, visible fugitive dust from shoulders and access roads;
    - Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
    - Controlling airborne, visible fugitive dust from debris being hauled away from the project site.
- If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch. Please also see fugitive dust fact sheet at: https://health.hawaii.gov/cab/files/2024/02/Hawaii-Fugitive-Dust-Fact-Sheet-February-2024.pdf.

Includes construction, demolition, or renovation activities that involve potential asbestos and lead containing materials

- Please contact the Indoor and Radiological Health Branch at (808) 586-4700 or visit: https://health.hawaii.gov/irhb/

Increases the population and potential number of vehicles in an area

- The creation of apartment buildings, complexes, and residential communities may increase the overall population in an area. Increasing the population in an area may inadvertently lead to more air pollution via vehicle exhaust. Vehicle exhaust releases pollutants in the air that can negatively impact human health and air quality, including lung irritants, carcinogens, and greenhouse gases.
- Ensure that drivers keep vehicle idling times to three (3) minutes or less.
- Consider and incorporate support for alternative transportation options such as bike racks and/or electric vehicle charging stations where possible.

If you have any questions, please contact the Clean Air Branch at (808) 586-4200 or at cab@doh.hawaii.gov.

From:	no-reply@wspis.com
Sent:	Thursday, February 20, 2025 8:07 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Kathleen
Last Name: Rooney
Email Address: krooney@ulupono.com
Join Mailing List: True
Comment:
Ulupono Initiative appreciates the Hawaii Department of Transportation's work on this realignment project and generally supports the chosen alternative; we acknowledge the significant amount of care and time spent on this project to bring it to this point. We also appreciate the department's transparent approach on the website, particularly the explicit connection to the Olowalu project, as well as discussions on Maui County's role in the use of the old road. While acknowledging these efforts, we recommend — similar to our past comments — that consideration be made to strengthening the multimodal and active transportation components within the project framework. This could include any number of more robust commitments, including: • Consider modifying the current cross-section design to be more amenable to active transportation elements, such as a moving the roads more inward and including a multi-use path. • Strengthen financial commitments to the active transportation infrastructure. While the West Maui Greenway represents a promising initiative, securing dedicated funding would ensure its implementation. Similar funding considerations could benefit the Olowalu project, creating a comprehensive active transportation network. This list is not exhaustive, and Ulupono stands ready to collaborate on the exploration of these and other options with Hawaii Department of Transportation. Mahalo, Kathleen Rooney Director, Transportation Policy and Programs Ulupono Initiative

Comment Log Submission No. 67

From: Morgan, Jeremy K CIV USARMY CEPOH (USA) <Jeremy.K.Morgan@usace.army.mil>
Sent: Friday, February 21, 2025 1:01 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] U.S. Army Corps of Engineers Comments on Honoapi'ilani Highway Improvements Project Draft EIS

Aloha Mr. Tatsuguchi,

Please see the attached comment form for the Honoapi'ilani Highway Improvements Project draft EIS. 1

Mahalo,

Comment Log Submission No. 68

Jeremy Morgan
Biologist/Regulatory Specialist
Regulatory Division
U.S. Army Corps of Engineers | Honolulu District
230 Otake Street, Building 252
Fort Shafter, Hawaii 96858-5440
Phone: 808-551-5496
Jeremy.K.Morgan@usace.army.mil
https://www.poh.usace.army.mil/Missions/Regulatory/

Comment Form

Honoapiʻilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapiʻilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

Thank you for allowing the U.S. Army Corps of Engineers the opportunity to provide comments
on the Honoapi'ilani Highway Improvements Project draft EIS. When fill quantities and impact
areas within aquatic resources are finalized, please submit a Corps permit application to
CEPOH-RO@usace.army.mil, so we can begin the review process for discharges of fill under
Section 404 of the Clean Water Act.

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name:

Address:

City: State: Zip:

Email: Phone:

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*
❑ Newspaper ❑ Email ❑ Community board ❑ Word-of-mouth ❑ Social media
❑ Other: _____

Was the information easy to understand and informative? ❑ Yes ❑ No

Please indicate which of the following best represents you:
❑ Local Resident ❑ Local Business/Industry/Trade Association ❑ Neighborhood Group
❑ Local Non-Profit Organization ❑ National Environmental Organization
❑ Local or State Government ❑ Federal or Tribal Government
❑ Other (please specify) _____

Answering the following questions is optional, but your response will be extremely helpful in ensuring the fairness and equity of HDOT's public involvement process. Submissions will be kept confidential and separate from any personally identifiable information.

What is your race?
❑ Black or African American ❑ American Indian or Alaskan Native ❑ Asian
❑ Hispanic or Latino ❑ White ❑ Native Hawaiian or Other Pacific Islander
❑ I prefer to self-describe: _____

What is the primary language spoken in your home?
❑ English ❑ Hawaiian ❑ Spanish ❑ Tagalog ❑ Vietnamese
❑ Other (Please specify): _____

Was project information translated into other languages appropriately?
❑ Yes ❑ No ❑ Specify: _____

Gender identity:
❑ Man ❑ Woman ❑ Non-binary ❑ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?
❑ Yes ❑ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

Comment Log Submission No. 69

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

January 8, 2025

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
___Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Maui District (dlnr.land.maui@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: DEIS for **Honoapi'ilani Highway Improvements**
LOCATION: Ukumehame to Launiupoko, Lahaina, Island of Maui; Portions of TMK Plats: (2) 4-7-001, 4-8-0001, 002, 003,004, and Honoapi'ilani Highway ROWs
APPLICANT: Hawaii Department of Transportation, Highways Division

Transmitted for your review and comment is information on the above-referenced subject matter. The DEIS was published on January 8, 2025, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2025-01-08-TEN.pdf

Please submit any comments by **February 21, 2025**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(☑) Comments are included/attached.

Signed: *Brian J. Neilson*
Print Name: Brian J. Neilson-Administrator
Division: Aquatic Resources
Date: 02/21/2025

Attachments
cc: Central File

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL
RESOURCES DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 2/21/2025

DAR # AR6823

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Haruko Mauro-Koike, Aquatic Biologist

SUBJECT: Review of DEIS for Honoapi'ilani Highway Improvements

Request Submitted by: Russell Y. Tsuji, Land Administrator

Location of Project: Ukumehame to Launiupoko, Lahaina, Island of Maui; Portions of TMK Plats: (2) 4-7-001, 4-8-0001, 002, 003,004, and Honoapi'ilani Highway ROWs

Brief Description of Project:

Honoapi'ilani Highway (State Route 30) provides the main access between communities along the west coast of Maui and the rest of the island and is subject to periodic flooding and coastal erosion. The primary purpose of this project is to provide a reliable transportation facility in West Maui by reducing the highway's vulnerability to coastal hazards. Specifically, the project proposes to relocate about 6 miles of the highway away from the coastline from approximately milepost 11, in the vicinity of Pāpalaua Wayside Park to Launiupoko, at milepost 17, the existing southern terminus of Lāhainā Bypass.

Comments:

☐ No Comments ☑ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: _____ Date: 02/21/2025

Brian J. Neilson
DAR Administrator

DAR# AR6823

Comments

The project will cross two major streams—Ukumehame and Olowalu—but the Draft Environmental Impact Statement (EIS) does not adequately assess the potential impacts of the highway relocation on these streams. Both streams are home to endemic Hawaiian gobies, including the IUCN-listed Sicyopterus stimpsoni, and snails, which have been observed during the CWRM/DAR stream monitoring. As these species are amphidromous, they rely on healthy and continuous stream habitats for their life cycles. Therefore, we recommend that a more detailed analysis of impacts to the stream habitats be included in this EIS.

Additionally, the EIS does not clearly specify the type of stream crossing to be used. The impact on water flow and habitat connectivity will differ significantly depending on whether a culvert, bridge, or viaduct is employed. It is important to note that culverts, over time, can develop undercuts and erosion, which can obstruct the migration of stream species and disrupt habitat continuity. These potential issues should be avoided. There are also no clearly defined Best Management Practices (BMPs) for stream protection during construction.

The report identifies Alternative 2 as the preferred route for Olowalu and Alternative 1 for Ukumehame. However, in Table S-3, a new column labeled "Preferred Alternative" appears, which the score does not seem to align with Ukumehame's Alternative 1. Figure S-6 depicts the preferred alternative route, but it labels it as U-1 and O-2, making it difficult to clearly distinguish the modified section. According to Table S-3, the preferred alternative is intended to reduce impacts to the wetland, and we would like to see a clearer depiction of how this route has been modified from Alternative 1 on the map. Furthermore, it would be appreciated if wetland and other waterbodies are delineated in the map to assess the impact to the area more accurately.

Although O-3/4 and U-4 did not achieve the highest overall score, from an environmental perspective, these alternatives perform well by minimizing impacts to the wetland and preserving the vulnerable lower stream reach habitat. This habitat is crucial for two of our endemic goby species, Eleotris sandwicensis and Stenogobius hawaiiensis, which are unable to migrate to the upper reaches. Additionally, the sea level rise simulation indicates that certain sections of the preferred U1 route will be adjacent to or within the sea level rise exposure area, potentially increasing the risk of coastal hardening and erosion in the future.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

January 8, 2025

MEMORANDUM

FROM: ~~TO:~~ **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
___ Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Maui District (dlnr.land.maui@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO: ~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **DEIS for Honoapi'ilani Highway Improvements**
LOCATION: Ukumehame to Launiupoko, Lahaina, Island of Maui; Portions of TMK Plats: (2) 4-7-001, 4-8-0001, 002, 003,004, and Honoapi'ilani Highway ROWs
APPLICANT: Hawaii Department of Transportation, Highways Division

Transmitted for your review and comment is information on the above-referenced subject matter. The DEIS was published on January 8, 2025, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2025-01-08-TEN.pdf

Please submit any comments by **February 21, 2025**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are included/attached.

Signed: *Dina Lau*
Print Name: Dina U. Lau, Acting Chief Engineer
Division: Engineering Division
Date: Feb 18, 2025

Attachments
cc: Central File

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: DEIS for Honoapi'ilani Highway Improvements
Location: Ukumehame to Launiupoko, Lahaina, Island of Maui
TMK(s): (2) 4-7-001, 4-8-001, 002, 003, 004, and Honoapi'ilani Highway ROWs
Applicant: Hawaii Department of Transportation, Highways Division

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fhat.hawaii.gov) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
DINA U. LAU, ACTING CHIEF ENGINEER

Date: Feb 18, 2025

Comment Log Submission No. 71

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES | KA 'OIHANA KUMUWAIWAI 'ĀINA
COMMISSION ON WATER RESOURCE MANAGEMENT | KE KAHUWAI PONO
P.O. BOX 621
HONOLULU, HAWAII 96809

Feb 3, 2025

REF: RFD.6371.6

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: Ciara W.K. Kahahane, Deputy Director
Commission on Water Resource Management

SUBJECT: Honoapi'ilani Highway Improvements

FILE NO.: RFD.6371.6
TMK NO.: (2) 4-7-001, 4-8-0001, 002, 003,004

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☒ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

- [X] 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- [ ] 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- [ ] 11. The Hawaii Water Plan is directed toward the achievement of the utilization of reclaimed water for uses other than drinking and for potable water needs in one hundred per cent of State and County facilities by December 31, 2045 (§174C-31(g)(6), Hawaii Revised Statutes). We strongly recommend that this project consider using reclaimed water for its non-potable water needs, such as irrigation. Reclaimed water may include, but is not limited to, recycled wastewater, gray water, and captured rainwater/stormwater. Please contact the Hawai'i Department of Health, Wastewater Branch, for more information on their reuse guidelines and the availability of reclaimed water in the project area.
- [ ] 12. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- [ ] 13. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- [ ] 14. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- [ ] 15. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- [ ] 16. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- [ ] 17. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- [ ] 18. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- [ ] 19. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

- [ ] OTHER:

If you have any questions, please contact Ryan Imata of the Groundwater Regulation Branch at (808) 587-0225 or Katie Roth of the Planning Branch (808) 587-0216.

MA-25-120 AW

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

Comment Log Submission No. 72

January 8, 2025

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
__ Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Maui District (dlnr.land.maui@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: DEIS for **Honoapi'ilani Highway Improvements**
LOCATION: Ukumehame to Launiupoko, Lahaina, Island of Maui; Portions of TMK Plats: (2) 4-7-001, 4-8-0001, 002, 003,004, and Honoapi'ilani Highway ROWs
APPLICANT: Hawaii Department of Transportation, Highways Division

Transmitted for your review and comment is information on the above-referenced subject matter. The DEIS was published on January 8, 2025, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2025-01-08-TEN.pdf

Please submit any comments by **February 21, 2025**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are included/attached.

Signed: Michael Cain
Print Name: MICHAEL CAIN
Division: OCCL
Date:

Attachments
cc: Central File

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
Office of Conservation and Coastal Lands
P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RYAN K.P. KANAKA'OLE
FIRST DEPUTY

CIARA W.K. KAHAHANE
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:AW

Corr. MA-25-120

MEMORANDUM

TO: Russell Y. Tsuji, Administrator
Land Division Administrator

FROM: Michael Cain, Administrator
Office of Conservation and Coastal Lands (OCCL)

SUBJECT: Draft Environmental Impact Statement (DEIS) for Honoapi`ilani Highway Improvements, Ukumehame to Launipoko, Lahaina, Island of Maui; Portions of Tax Map Keys (TMKs) (2) 4-7-001, (2) 4-8-001, (2) 4-8-002, (2) 4-8-003, and (2) 4-8-004.

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) is responding the request for comments on the DEIS for the proposed Honoapi`ilani Highway Improvements. The OCCL regulates land uses in the Conservation District. The preferred alternative as presented in the DEIS moves the existing highway out of the Conservation District and away from coastal hazards and sea level rise. According to the plans as presented in the DEIS, the intent of DOT is to leave the existing road and shoreline hardening structures in place, and to transfer ownership and maintenance responsibilities to Maui County to become a local access road. OCCL would like to see an assessment of the cost and long-term impact to the shoreline of removal of the existing road and all affiliated protective structures. Given the history and exposure of portions of the existing road to high waves, high tides and sea level rise, ongoing hardening and continual maintenance operations in the Conservation District may be required to maintain the road in service.

Portions of the old road are in the Limited Subzone of the Conservation District. Per HAR §15-5-12, the objective of the Limited Subzone is to "limit uses where natural conditions suggest constraints on human activities". The natural conditions at the location of the existing highway have necessitated the improvement plan and realignment of the road away from coastal hazards and sea level rise. As identified in the DEIS, approximately four of the six miles of highway proposed for relocation are in the sea level rise exposure area (SLR-XA) at a predicted 3.2ft of sea level rise. The DEIS acknowledges that continued use of the highway at its existing location would require ongoing maintenance work and hardening to achieve short-term fixes to

the chronic impacts of coastal hazards. Footnote 5 on page 2-12 of the DEIS states the following: "As part of the relinquishment process, HDOT and the FHWA must concur that the land is not needed for federal-aid Highway purposes in the foreseeable future, that the new roadway segment and its traffic operations would not be adversely affected by relinquishments, and that the lands are not suitable to restore, preserve, or improve the scenic beauty of the new roadway."

The lands which are currently occupied by the existing highway are suitable for restoration. Naturalization of the shoreline would improve public access, return public trust land to the public, and benefit reef health at the Olowalu reef by enabling the land to naturally filter freshwater runoff. Restoration may provide a more substantial storm and wave buffer for the areas of the realigned highway which will remain in the SLR-XA. Finally, the scenic beauty of the realigned road will be improved if the existing road is removed and restored to a natural beach profile.

Please contact Amy Wirts, University of Hawai'i Sea Grant Extension Agent and OCCL Coastal Lands Program Coordinator at (808) 587-0376 or by email at Amy.E.Wirts@hawaii.gov, should you have any questions regarding this matter.

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

Comment Log Submission No. 73

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

January 8, 2025

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
___Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Maui District (dlnr.land.maui@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: DEIS for **Honoapi'ilani Highway Improvements**
LOCATION: Ukumehame to Launiupoko, Lahaina, Island of Maui; Portions of TMK Plats: (2) 4-7-001, 4-8-0001, 002, 003,004, and Honoapi'ilani Highway ROWs
APPLICANT: Hawaii Department of Transportation, Highways Division

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https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2025-01-08-TEN.pdf

Please submit any comments by **February 21, 2025**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
(☑) We have no comments.
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: _____

Print Name: _____

Division: DLNR - MDLO

Date: 02/21/2025

Attachments
cc: Central File

From:	no-reply@wspis.com
Sent:	Thursday, February 20, 2025 8:07 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Kathleen
Last Name: Rooney
Email Address: krooney@ulupono.com
Join Mailing List: True
Comment:
Ulupono Initiative appreciates the Hawaii Department of Transportation's work on this realignment project and generally supports the chosen alternative; we acknowledge the significant amount of care and time spent on this project to bring it to this point. We also appreciate the department's transparent approach on the website, particularly the explicit connection to the Olowalu project, as well as discussions on Maui County's role in the use of the old road. While acknowledging these efforts, we recommend — similar to our past comments — that consideration be made to strengthening the multimodal and active transportation components within the project framework. This could include any number of more robust commitments, including: • Consider modifying the current cross-section design to be more amenable to active transportation elements, such as a moving the roads more inward and including a multi-use path. • Strengthen financial commitments to the active transportation infrastructure. While the West Maui Greenway represents a promising initiative, securing dedicated funding would ensure its implementation. Similar funding considerations could benefit the Olowalu project, creating a comprehensive active transportation network. This list is not exhaustive, and Ulupono stands ready to collaborate on the exploration of these and other options with Hawaii Department of Transportation. Mahalo, Kathleen Rooney Director, Transportation Policy and Programs Ulupono Initiative

Comment Log Submission No. 74

From: TN JD <tnjd76@gmail.com>
Sent: Saturday, February 22, 2025 9:24 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; honoapiilanieis@online.wspis.com
Subject: [EXTERNAL] Maui Greenway Project and Realignment of the Honoapi'ilani Hwy Testimony

Aloha,

Comment Log Submission No. 75

I am writing to express my support for the proposed 6.5-mile mauka relocation of the Honoapiʻilani Highway, in conjunction with the Maui Greenway Project . Before moving to the islands in 2018, I had lived in two towns/cities (Boulder, CO and Melbourne, Australia) with amazing greenway infrastructure, and had travelled to several others (Austin, TX, Copenhagen, DEN, Sydney, AUS) I saw the benefits that the greenways brought to the communities where they were located. They were heavily utilized for commuting and exercise, but also created environmental enhancement and protection. The greenways created natural buffers and green spaces and reduced congestion, but also created a tighter knit sense of community and a peaceful environment for nearby home owners. 1

My dream is that Maui could become another model community which demonstrates the positive impacts of greenspace and greenways, and this is the perfect opportunity to begin making this happen. I feel like it could be a key component to recreating a sense of renewal on the West Side while also creating a sense of newness and hope in the community and island at large.

Further, this is a critical realignment that will safeguard a vital transportation corridor that serves as a lifeline for West Maui residents, workers, and visitors, addressing the escalating risks posed by rising sea levels and climate change. As we work toward a more resilient future, this project is a pivotal step in West Maui's recovery, resilience, and sustainability.

I respectfully urge the Hawaiʻi Department of Transportation (HDOT) to prioritize the following key elements within this project:

1. Utilization of the Old Highway 30 for West Maui Greenway Segments 6 and 7
    - The existing coastal highway presents an ideal route for a dedicated bike and pedestrian path.
    - Repurposing this scenic corridor as a multi-use trail is a cost-effective solution that supports safe, non-motorized transportation and recreation.
    - This approach would facilitate the implementation of Segments 6 and 7 of the WMG (as outlined on pages 111 and 51 of the WMG Master Plan), creating a continuous and connected path linking West Maui communities.

2. Alignment with Climate and Community Goals
    - Incorporating the WMG within the realignment project would align with Maui's commitment to climate resilience, as outlined in the Nā Wahine Climate Settlement Agreement.
    - A multi-modal transportation corridor, featuring pedestrian and bike-friendly infrastructure, supports efforts to reduce emissions, promote healthy lifestyles, and enhance disaster preparedness.
3. Community-Driven Design for Long-Term Benefits
    - By transforming the former highway into a recreational and commuting pathway, we can create a lasting community asset that bolsters economic recovery, and public health.
    - A dedicated bike and pedestrian trail would provide safe, scenic access to key cultural and natural landmarks, fostering community pride and environmental stewardship.

In summary, while I support the current realignment effort, I respectfully request that the HDOT integrates plans for the West Maui Greenway into the redevelopment of the former highway route. By repurposing this space for non-motorized transportation, we can build a legacy of sustainable infrastructure that meets the needs of future generations and supports West Maui's long-term recovery and growth.

Thank you for the opportunity to provide testimony.
Mahalo nui loa for your consideration.

--
Julie Durham
LMW, VSW
808-673-6970

Comment Log Submission No. 76

-----Original Message-----
From: Dr. Marion Ceruti <ceruti@earthlink.net>
Sent: Friday, February 21, 2025 5:26 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Subject: [EXTERNAL] Proposal to install road mauka of Honoapi'ilani Hwy N of Papalaua on Maui

Aloha Mr. Tatsuguchi,

Mahalo for the opportunity to comment on the EIS for the proposed road project.

In general, the idea is good but care should be taken to provide sufficient exits and roads in the makai direction for beach access, to include better parking, particularly at the Ukumehame beach park, on the mauka side of the existing road, if possible.

Moreover, more and better parking is needed at the Ukumehame Firing Range[1] to keep users from having to park their cars in the mud puddles. This is a great opportunity to upgrade the parking at Papalaua to do something about the drainage problem that has plagued the area for years.

It might be necessary to relocate the nenes in the area temporarily, for their safety.

E Hana Kakou,

Dr. Marion Ceruti,
West Maui resident

Sent from my iPad

JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

Comment Log Submission No. 77

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
KA 'OIHANA HO'ONA'AUAO
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF FACILITIES AND OPERATIONS

February 21 , 2025

Mr. Ken Tatsuguchi, PE
Hawaii Department of Transportation
Highways, Planning Branch
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Re: Honoapiilani Highway Improvements

Dear Mr. Tatsuguchi:

Thank you for your email dated January 6, 2025. Based on the information provided and despite the Lahaina Bypass Highway serving as an alternate route for Honoapiilani Highway, the Hawaii State Department of Education (Department) is concerned about commute times and traffic patterns for its students, parents, and staff as there are many that have been displaced to different parts of the island due to the West Maui Wildfires. With the uncertainty that still lies ahead, the Department requests that your staff and consultants meet with the administrators of Lahainaluna High, Lahaina Intermediate, and Nahienaena Elementary Schools to present traffic impacts leading to and from each of these campuses and specific timelines associated with the project.

Should you have any questions, please contact Cori China, of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us.

We appreciate the opportunity to comment.

Sincerely,

Roy Ikeda
Interim Public Works Manager
Planning Section

RI:ctc
c: Rebecca Winkie, Complex Area Superintendent, Hana-Lahainaluna-Lanai-Molokai Complex Area
Facilities Development Branch

From: Dennis Eyler <denne712@aol.com>
Sent: Monday, February 10, 2025 2:26 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; honoapiilanieis@online.wspis.com
Subject: [EXTERNAL] H-30 Project DEIS

Comment Log Submission No. 78

Aloha,

I was able to attend the first four of the public presentation of the DEIS for this project on January 23. I have filled out the form that was handed out and I have attached a copy to this email.

My interest in this project is based on several things. 1

1. My wife and I have been regular visitors to Maui since the 1990's. In 2012, after I retired, we bought a residence here and since then, we spend several months of the year on the island.

2. We were shocked and saddened at what happened to Lahaina as a result of the fires. We know several people who lost their homes.

3. I would like to help in the island's recovery.

4. I spent my career as a traffic and highway preliminary design engineer, and I worked as an employee for 2 state transportation departments and then as a consultant for government agencies for 35 years and worked on highway projects in 6 different states. I have attached a copy of my resume.

5. Since the 1990's I have been involved with the development and implementation of projects meeting the design criteria of the Super-2 highway concept and also in the development and implementation of reduced conflict intersections (RCIs). The RCI concept utilizes the proven safety benefits of certain roundabout features but also strives to minimize the added travel time to the major roadway when it intersects with low volume minor roadways. I have attached a few of the technical papers I have presented on these topics. The most recent was at the University of Minnesota's Center for Transportation Studies annual meeting in 2023. It was on the subject of the Super-2 and in that presentation, I referenced the completed section of the Lahaina Bypass on pages 14 and 35.

6. I am also very impressed by the high daily traffic volumes carried by the existing facility. Of course, I also realize that the flows are fairly balanced directionally and that there are no high-volume crossing roadways due to the roadway following the coastline.

7. In viewing the various materials of this projects DEIS, I quickly concluded that the project as a whole is badly needed. The environmental issues are many and I certainly have no problem with the preferred alignment and its proposed limited access.

8. I do have some questions about the geometry that is proposed for those limited access intersections. I also realize that the figures in the DEIS are conceptual and not final.

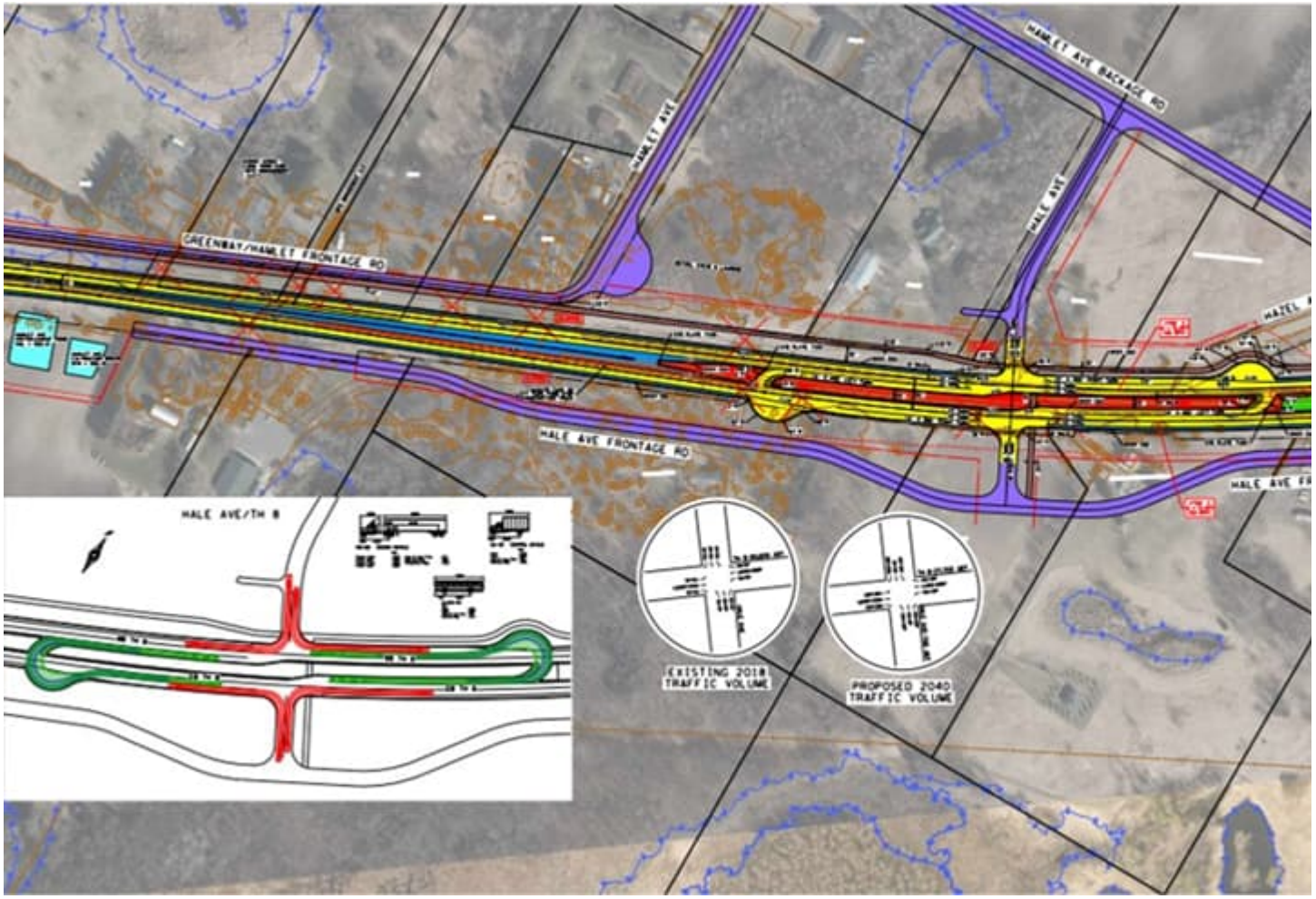
a. The use of left side acceleration lanes without sufficient length to allow entering traffic to get up to speed and the requiring those vehicles to merge right. In my experience left side merges and lane drops have proven to have higher crash rates. Having those entering left turns sit in the center of the roadway without any physical, lateral buffering space from traffic passing on both sides at higher speeds, would seem to be uncomfortable for the drivers and may result in sideswipe crashes. However, since there are many existing locations with left side merges on Maui, my concerns would be greatly lessened if the crash data shows that they perform safely on Maui.

9. The Reduced Conflict Intersection (RCI) design concept eliminates those problems and provides the following benefits. All conflict points involve traffic headed in on direction conflicting with another single traffic movement. At all conflict points the “threat” or priority traffic movement is always approaching from the left or from ahead, never from the right. Since drivers sit on the left sides of their vehicles, this provides good visibility when selecting a gap to enter or cross traffic. No left turns are required into higher speed, higher volume traffic flows. Those features provide safety advantages

similar to roundabouts. In addition, RCIs provide two stage crossings of the heavy, high-speed traffic movements and two stage left turns onto the major roadways for any length vehicle. Vehicles of any length are not required to cross both directions of the major roadway while requiring a gap in both directions.

10. The Minnesota DOT recently announced that on their rural divided highways, they will no longer construct full movement intersections without traffic signals or roundabouts being provided on day 1. Instead, they will use J-turns or Restricted Crossover U-turns (RCUTS), both of those designs meet the criteria of the RCI.

Here is a picture of a MnDOT J-turn for an intersection on a divided highway. Traffic entering from the minor road desiring to cross or turn or turn left, waits for a gap in traffic approaching from the left and then crosses the through lanes and enters the turn lane for the downstream U-turn. The turn lane length for the U-turn is based on speed and storage needs. At the U-turn intersection, a pavement “loon” or widening is provided to accommodate the turning path of the design vehicle making that U-turn. There are other possible designs based on speeds and major roadway traffic volumes.



There have been RCUT intersections built on high volume, high-speed roadways were traffic on the minor street turns right, merges, then weaves across to a downstream U-turn Lane. The distances needed for that weave are typically greater than 1700 feet. A J-turn on a high-volume, two-lane roadway would probably not need to use a design where entering traffic gets up to speed, merges, then exits, and slows to make the U-turn. With only one through lane, a gap in the traffic is likely to arrive due to a slow vehicle and the minor roadway$_3$vehicle desiring to cross or make a left onto the major roadway can easily get to the U-turn Lane.

Here is a typical sign used on the minor roadway approaches.

Here's an example of a full RCUT intersection. It's located at US-212 and MN-284 in Cologne, MN. This type of intersection is being used in Minnesota, Wisconsin, Maryland, North Carolina (they call them Super Streets) and Texas.

Here is a list of the attachments.

1. DEIS comment form

2. My resume.

3. The Super-2 presentation at the U of M CTS conference in 2023.

4. Alternative Intersection Designs Wis ACEC-2009

5. Sketches of possible Reduced Conflict Intersection designs for use of a “Super-2” roadway along with other information.

Look these materials over and use them as you desire.

I will not have any communications with the public regarding this material. I will always defer to the people responsible for operating the highways.

I will be on Maui and available to meet, if you so desire, until February 27th. I’ll be back on Maui during the first two weeks in June. If your consultant Jamie Bentz wants to contact me, when we are both in Minnesota, she is welcome to do so.

Mahalo for your efforts on this project. I am looking forward to its completion.

Dennis R. Eyler

763-744-7414

denne712@aol.com

Comment Form

Federal Highway Administration

Honoapi'ilani Highway Improvements DEIS

We want to hear from you! Please share your comments and questions with our team before February 24, 2025. More information on the Honoapi'ilani Highway Improvements project can be found at www.honoapiilanihwyimprovements.com. Thank you for your participation!

Aloha, my wife and I are part-time residents of Maui. We spend 3+ months of the year on island. I am also a retired traffic and highway preliminary design engineer. I am very interested in this project as well as the upcoming planned extension of the Lahaina bypass.

As a modest effort on my part to help in the recovery of the area after the Lahaina fire. I am offering my modest assistance, if desired. I have attached my resume and a few technical papers and presentations. Also attached is a more thorough description of my offer of assistance.

Providing your contact information below is optional. It will allow us to add you to the mailing/email list to receive future project information.

Name: Dennis R. Eyler

Address: Home – 2725 Oakview Lane, Maui – 3875 Lower Honoapi'ilani Road – B405

City: Home – Plymouth, MN 55441 State: Maui – Lahaina, HI Zip: 96761

Email: denne712@aol.com Phone: 763-744-7414

Share your comments and questions by handing in this form at the hearing, by sending this form via mail or email, or by calling Ken Tatsuguchi from the Hawaii Department of Transportation.

Ken Tatsuguchi, HDOT
Email: ken.tatsuguchi@hawaii.gov
Phone: 808-587-1830

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator Box 50206, 300 Ala Moana Blvd., Room 3-229, Honolulu, HI 96850

The questions below are **optional**, but intended to help our staff better understand what worked well and what improvements to consider for future public meetings.

How did you hear about this public meeting? *(please check)*

❑ Newspaper ☒ Email ❑ Community board ❑ Word-of-mouth ❑ Social media
❑ Other: _____

Was the information easy to understand and informative? ❑ Yes ❑ No

Please indicate which of the following best represents you:

❑ Local Resident ❑ Local Business/Industry/Trade Association ❑ Neighborhood Group
❑ Local Non-Profit Organization ❑ National Environmental Organization
❑ Local or State Government ❑ Federal or Tribal Government
☒ Other (please specify) Part-time resident

Answering the following questions is optional, but your response will be extremely helpful in ensuring the fairness and equity of HDOT's public involvement process. Submissions will be kept confidential and separate from any personally identifiable information.

What is your race?

❑ Black or African American ❑ American Indian or Alaskan Native ❑ Asian
❑ Hispanic or Latino ☒ White ❑ Native Hawaiian or Other Pacific Islander
❑ I prefer to self-describe: _____

What is the primary language spoken in your home?

☒ English ❑ Hawaiian ❑ Spanish ❑ Tagalog ❑ Vietnamese
❑ Other (Please specify): _____

Was project information translated into other languages appropriately?

❑ Yes ❑ No ❑ Specify: _____

Gender identity:

☒ Man ❑ Woman ❑ Non-binary ❑ I prefer to self-describe: _____

Do any individuals living in your home have a physical or mental impairment that substantially limits one or more major life activities?

❑ Yes ☒ No

Please suggest additional ways you think HDOT and FHWA can improve the inclusiveness of public outreach efforts. **Thank you for completing this survey!**

_____

_____

Dennis Eyler, retired PE, PTOE (registrations have lapsed)
Last employer - SRF Consulting Group, Inc. – Vice President -retired

Employment History

1967-68 - Maryland State Roads Commission-summer work on survey crew and as construction inspector
1969-1983 – Minnesota Department of Transportation: final design, traffic engineering, preliminary design, maintenance, highway safety analysis and 10 years as a District Traffic Signal and Lighting Engineer
1983 to 2023 - SRF Consulting Group – Principal and Vice President – In charge of traffic engineering and preliminary design concept development

Education

B.C.E., University of Minnesota - 1969
Post Graduate Courses

- Traffic Signals – FHWA sponsored short courses at Georgia Institute of Technology 1974 and 1975
- Traffic Safety Design – Texas Transportation Institute
- Highway/Railroad Grade Crossings –Northwestern University Traffic Institute
- Roundabout Design – Iowa State University – CTRE and Kittelson
- Interchange Design Workshop – Institute of Transportation Engineers

Registration - Minnesota (PE) No. 10792 and PE in Iowa - both lapsed
Certification - Professional Traffic Operations Engineer (PTOE) No. 576 - lapsed

Areas of Expertise

- Geometric Layout and Development
- Innovative Intersections and Interchanges
- Freeway Operations
- Urban Streets
- Transportation Corridor Studies
- Traffic Impact Studies
- Traffic Signal Design and Timing
- Traffic Simulation (VISSIM) - Signals, Roundabouts, LRT and Freeway Operations
- Intelligent Transportation Systems
- Highway/Railroad Grade Crossings
- Roundabout Planning and Preliminary Design

Professional Affiliations

Institute of Transportation Engineers - Fellow
ITS America
VISSIM User's Group
Transportation Research Board (TRB)

- Traffic Signal Systems Committee (past official committee member)
- Freeway Operations Committee, Geometrics Committee, Roundabout Committee

Mr. Eyler has more than 50 years of experience in traffic engineering and preliminary design. During his career he has demonstrated a high level of technical knowledge in these areas and an ability to use that knowledge to develop innovative solutions to complex transportation problems. Because of his extensive experience in traffic signal design and operations, preliminary design and traffic simulation, he has developed a full understanding of the relationship between intersection and interchange geometry and the operation of the traffic control devices at intersections and interchanges.
During his career he has served as a technical advisor in several areas, including Transportation Planning, Traffic Engineering, Intelligent Transportation Systems, Highway Engineering and Municipal Engineering.

The following is a list of selected non freeway projects, where Mr. Eyler has been involved with concept development and preliminary design.

- US 61 Bypass, Muscatine, IA – The project developed and evaluated various types of restricted crossover – U-turn designs (RCUT). This project was where the term "Reduced Conflict Intersection" (RCI) originated.
- Wisconsin STH 54 between Wisconsin Rapids and Plover – Concept development and evaluation of several possible RCUT locations
- Superior Street and Canal Park Drive in Duluth, MN – Conversion of 4 lane streets with parallel parking to a two-lane street with angle parking
- Projects with staged corridor development where the initial construction was a two-lane roadway later expanded to a four-lane divided highway. US 169 between Osseo and Champlin, MN, MN-101 between Rogers and Elk River, MN and MN-5 in Eden Prairie and Chanhassen, MN
- Stadium Road at Victory Drive in Mankato, MN – Alternatives evaluation, concept development, traffic simulation and preliminary design for roadway re-alignment to combine two "T" intersections into a single high-capacity roundabout

Freeway Interchange Projects

Mr. Eyler has been involved with concept development and preliminary design of more than 50 interchanges during his career. These are some worth noting.

I-494 at US 169 in Bloomington, Eden Prairie and Edina, Minnesota – Concept development and traffic analysis for a freeway-to-freeway interchange and 3 local access interchanges utilizing a total of 6 roundabouts at ramp intersections
I-35 at Dakota at County Roads, 50, 60 and 70, Reconstruction of 3 interchanges, in Lakeville, Minnesota
I-94 at Hennepin County Road 61 (Hemlock Lane), Maple Grove, Minnesota – Concept development and signal design for a high volume, local access interchange
I-35W at MN 62 (Crosstown Highway), Richfield and Minneapolis, MN – Alternatives development and analysis of a project to reconstruct a multiple interchange complex consisting of two directional interchanges and 5 access interchanges

US 169/MN 101 Bloomington Ferry Bridge Interchanges, Shakopee, MN – Concept development, freeway operations analysis for a freeway-to-freeway interchange and 4 service interchanges
MN 610 – A new freeway, Maple Grove and Brooklyn Park, Minnesota – Concept development for 2 systems interchanges and 4 service interchanges
I-90 at US14/61 in Dresbach, MN – Concept development for a complex interchange

Traffic Engineering Innovations

- 1975 – Started the widespread use of red left-turn arrows in Minnesota
- 1978 - Developed variable signal phase sequence control strategy with changeable lane use controls
- 1980 - Developed a traffic signal advance warning system that features "Prepare to Stop When Flashing" signs and flashers which was initially deployed at 5 intersections in the northern and southwestern suburbs of the Twin Cities.
- 1984 – For the City of Duluth, MN - designed one of the earliest central signal control systems which utilized "off the shelf" multiple traffic responsive master controllers operating in an overall organized pattern with a desk top computer as the system interface. The project also rebuilt over 50 individual signals.
- 1985 – Concept development and design of all of the traffic controls for a reversible HOV roadway running in the median of an at-grade roadway which initially passed through 5 signal-controlled intersections. It was known as the I-394 Interim HOV Lane (nick named the "sane Lane") and it helped manage traffic during the conversion of US 12 into I-394.
- 2007 – Alternatives evaluation, interchange concept development, and preliminary design of the signal controls for the Diverging Diamond Interchange (DDI) at I-394 and 34th Avenue in Bloomington, MN. This is the only DDI in the United States with an LRT line running through the interchange in the median.

Technical Papers Presented at National Conferences

TRB 2021- Compound Roundabouts (accepted for presentation, but unable to present due to COVID)
ITE 2019 – Median Reversible At-grade Toll Lane
TRB 2017 - Roundabout Ring Junction Interchange (I-494 at US 169)
ITE 2016 – Getting More Life from Old Diamond Interchanges
TRB 2011 – International Roundabout Conference – Other Geometric Factors Affecting Roundabout Capacity
TRB 2011 – The Reduced Conflict Intersection; also published by the National Academies of Science
FTOC 2008 – I-394 HOT Lane
TRB 2005 – The Arterial Interchange; also published by the National Academies of Science
ITE 2003 – Getting More Life from Old Cloverleaf Interchanges
ITE 2000 – The Reduced Conflict Intersection
ITE 1997 – Operating Two Adjacent Signals with One Controller
ITE 1994 – F.O.A.M. – A spreadsheet-based Freeway Operations Analysis Method
ITE 1986 – The I-394 Interim At-Grade Reversible HOV Lane

Technical Papers Presented at Regional and Local Conferences

2023 – University of Minnesota Center for Transportation Studies (CTS) – The Super-2
2018 – TRB Committee – Demand Based Signal Control for Restricted Crossover, U-turn Intersections
2012 – Image Sensing Systems - Brainstorming the Future of Roadway Transportation
2012 – TRB signal Systems Committee – Midyear meeting -The DDI Challenge
2011 – Midwest ITE – The Super Two
2011- Mid-Continent Transportation Research Symposium
Designing and Operating Intersections with Signals on High-speed Rural highways
2009 - ACEC/WisDOT Transportation Improvement Conference -Pointing to the Future Alternate Intersection Designs


2

The Super-2

DESIGN GUIDELINES FOR A SAFER, HIGH CAPACITY, RURAL, TWO LANE, AT-GRADE HIGHWAY

UNIVERSITY OF MINNESOTA CENTER FOR TRANSPORTATION STUDIES OCTOBER 2023

BY DENNIS EYLER AND ALEX POLETZ

Defining the Super-2

A set of design features for two lane highways to:

- **Maximize safety by reducing vehicle conflicts**
- **Increase capacity**
- **Provide reliable travel times**

It is not a two lane freeway

- It may be an interim phase to becoming a freeway
- It may be an interim phase to becoming a 4-lane expressway

Defining the Super-2

Design Guideline Goals

Handle traffic volumes of 8,000 to 20,000+

- Peak hour, peak directional flow of up to 1200+ vph

Safely handle traffic speeds of 50 to 70 miles per hour

Provide no direct property access

Limit full access to 1/2 mile or greater intervals

Provide full shoulders and clear zones

3 Primary Elements of a Super-2

Medians

Passing lanes

Reduced conflict junctions

Element 1

Medians to reduce conflicts

- Striped with a minimum width of 4 feet
  - May have a barrier
- Provide separation from opposing traffic
- No crossing center line to pass
- Prohibit lefts onto the Super-2 and crossings of the Super-2 except at controlled locations

Element 2

Passing lanes and auxiliary lanes

- Passing Lanes
  - Regularly spaced based on speeds & traffic makeup
  - Length - at least 40 seconds of travel time
  - Use on steep grades
- Auxiliary Lanes
  - Add capacity through junctions
  - Allow passing when leaving towns or other slow areas

Element 3

Reduced conflict junctions

- Reduced conflict intersection designs
  - **RCUTs** - Restricted Crossover U-turns
  - **J-turns** – Right turn followed by U-turn
  - **“T” intersections** - Certain designs
- Limited use of signals and roundabouts
  - Only at high volume crossing roads
- Low cost interchanges

Super-2 History

1940 – 1970 – High speed alignments & access management

1970 – 1990 – Two lane roads built as first phase of 4 lane expressway

1990 – 2000 – Striped medians & passing lanes – the name Super-2 is first used

2000 – today – More highways with Super-2 features

No full Super-2 has yet been built

However - US-1 south of Florida City, FL is very close

1940's to 1960's

Enhanced two lane rural roadways started to appear in the U.S. just after WWII.

Examples – Maryland - single roadways built for future divided highways

- **US 40 and US 15 near Frederick and US 29 south of Baltimore**

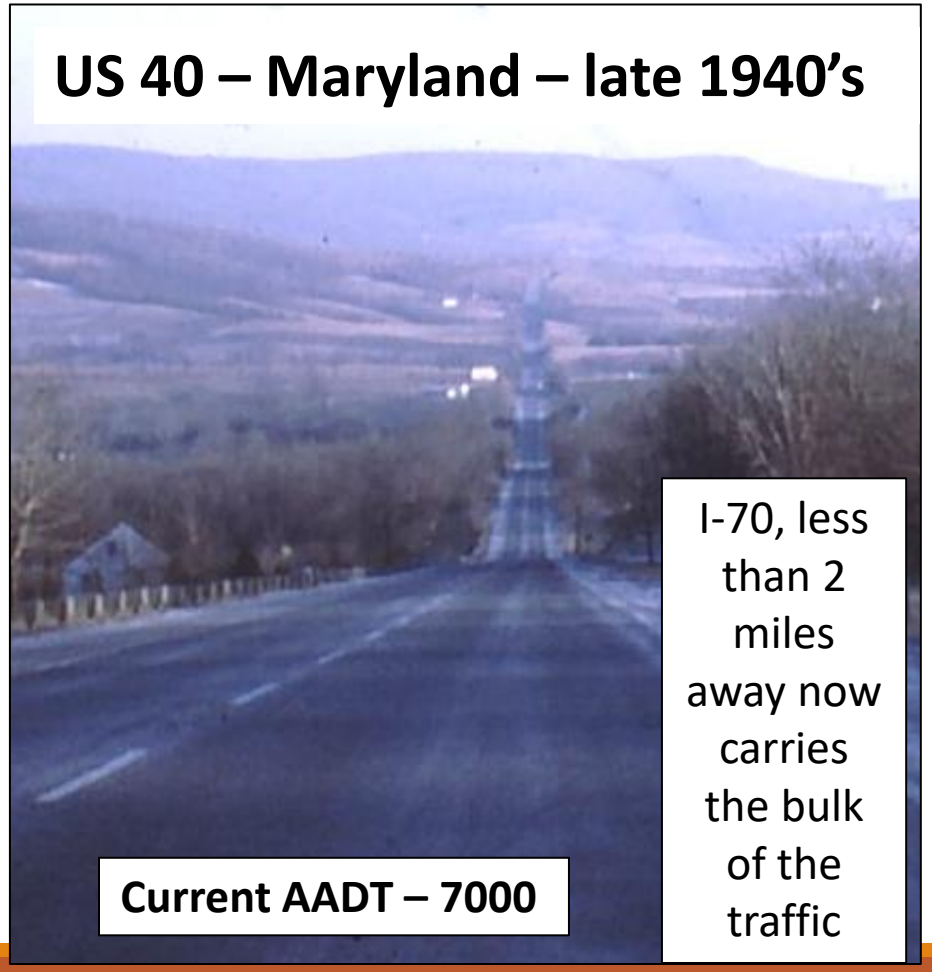
Features

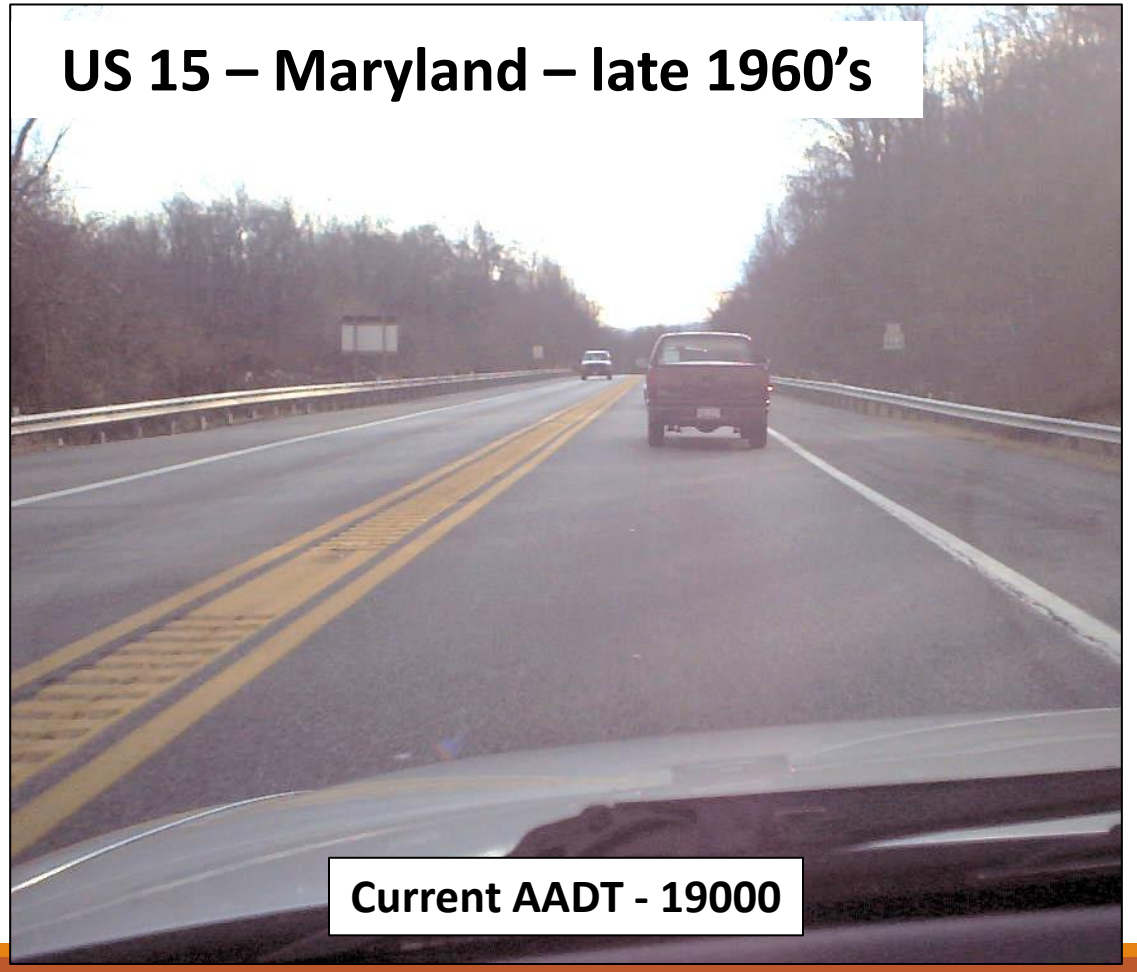
- **Limited access to key intersections, high-speed alignments, but no median**

Two lane designs - on low volume Interstates (ADTs less than 5000)

- **I-70 in Colorado and Utah, I-29 North of Grand Forks, I-95 in northern Maine and I-15 in Idaho and Montana. I-93 at Franconia Notch in New Hampshire is the last two lane Interstate. It has median guardrail.**

Early Examples





History - 1970's and 1980's

Minnesota - short segments of two lane expressways were built and designed to become one side of a 4-lane divided highway

- US 169 - Osseo to Champlin
- MN 5 west of I-494
- MN 101 north of Rogers
- MN 60 in southwestern Minnesota

Channelized intersections with signals, limited access, but medians only at intersections

History - 1990's and 2000's

Other states - enhanced two lane roadways

- **California - striped median buffer strips**
- **Texas - two lanes + one - with alternating passing lanes – named "Super-2"**
- **Maryland - MD-90 – The Ocean City Expressway – limited access with interchanges, signals and median barrier**

Blue Earth County - Mankato South Route (CSAH 90)

- **One side of a planned divided highway – future MN 60 bypass of Mankato**
- **A striped median was considered - not approved by State Aid**
- **Passing lanes were provided and there is a roundabout at the junction with MN 22**

History - 2000's to now

Other states build enhanced rural two lane roadways

- **Hawaii – Lahaina bypass - one side of future 4-lane divided highway**
- **Wyoming – Rawlins to Casper – two lane roadway with frequent passing lanes**
- **Minnesota - MN 7 - passing lanes and roundabouts**

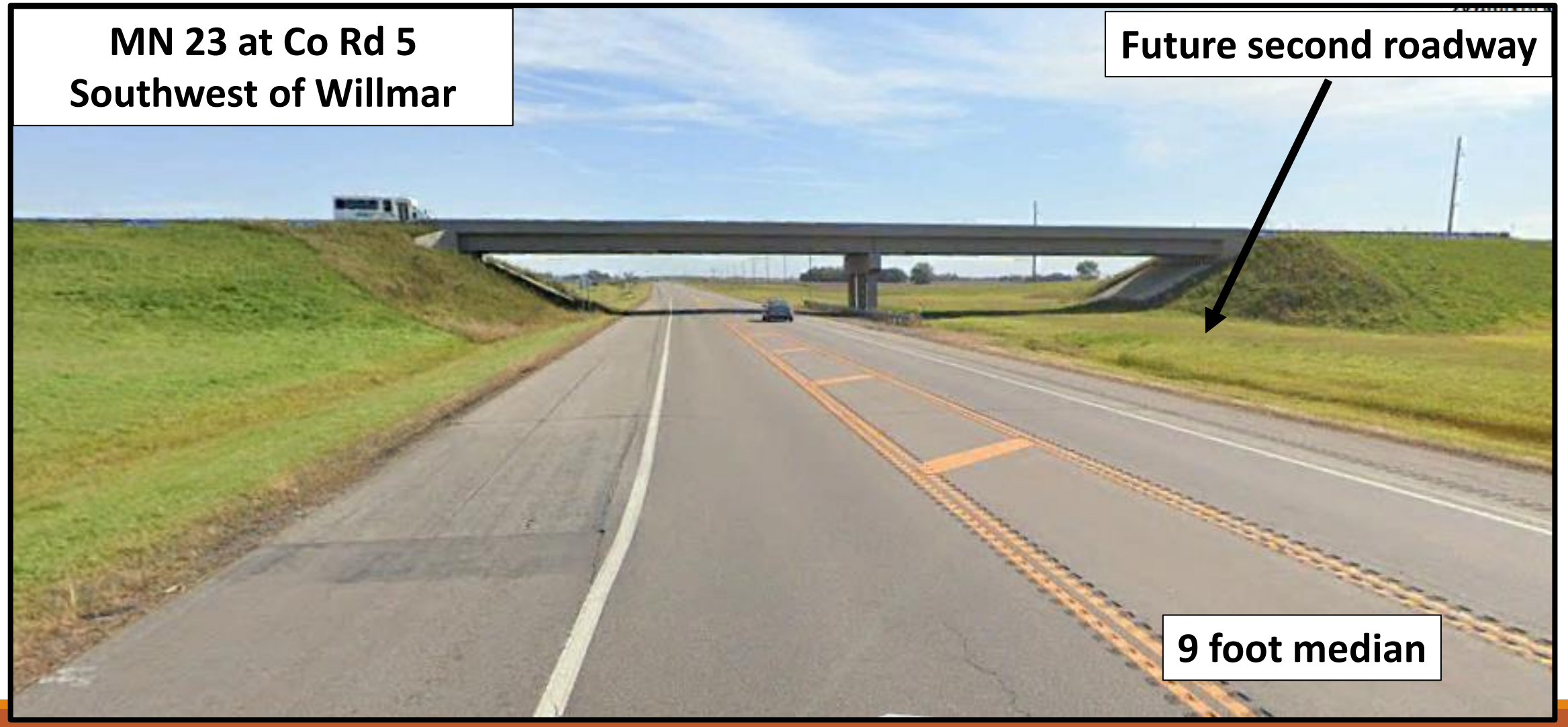
New Zealand starts to use striped medians and J-turns

Highway Capacity Software currently describes a Super-2 as a 3 lane road with alternating passing lanes – ***the Texas definition***

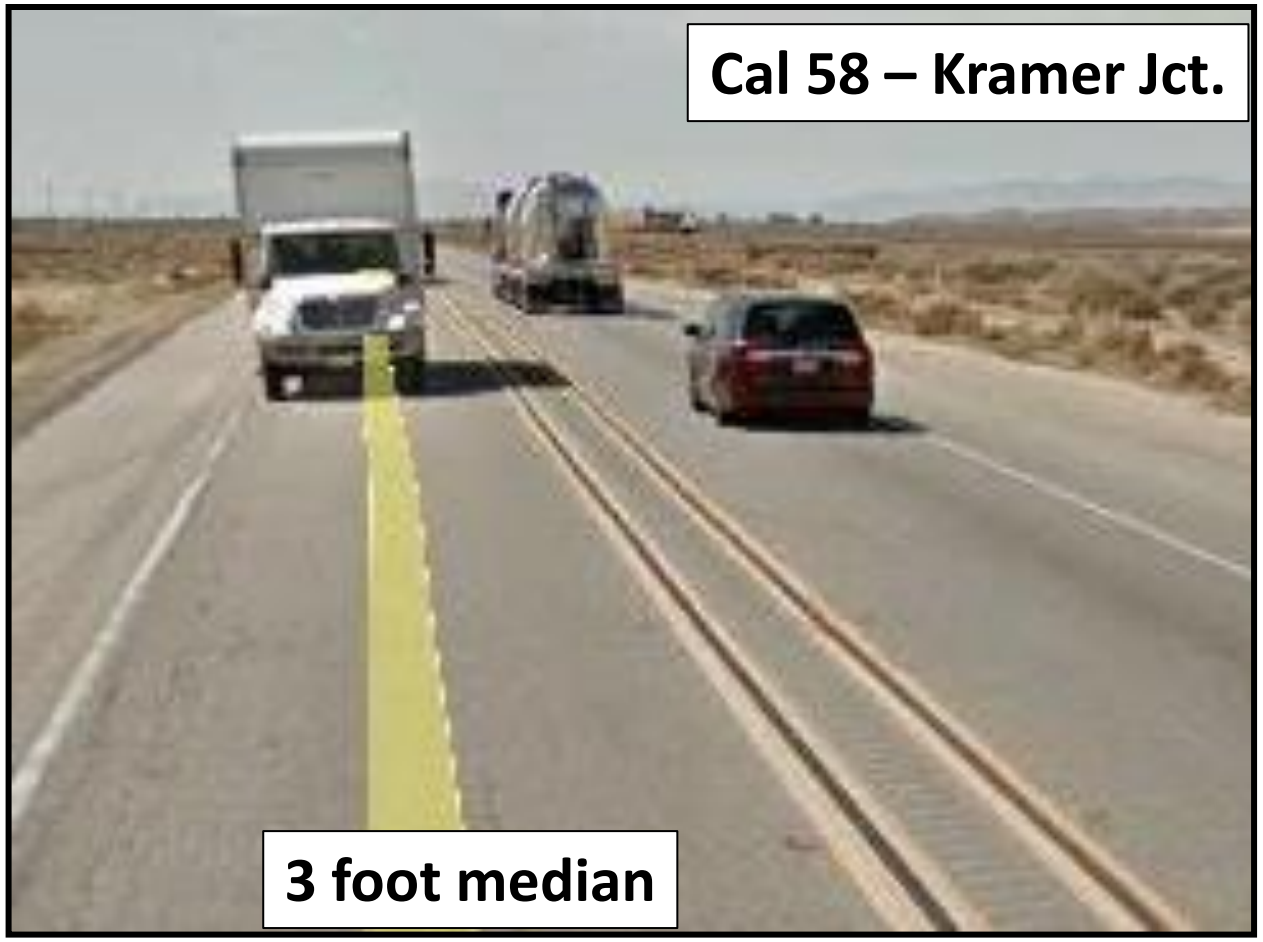
Examples of the Defining Elements

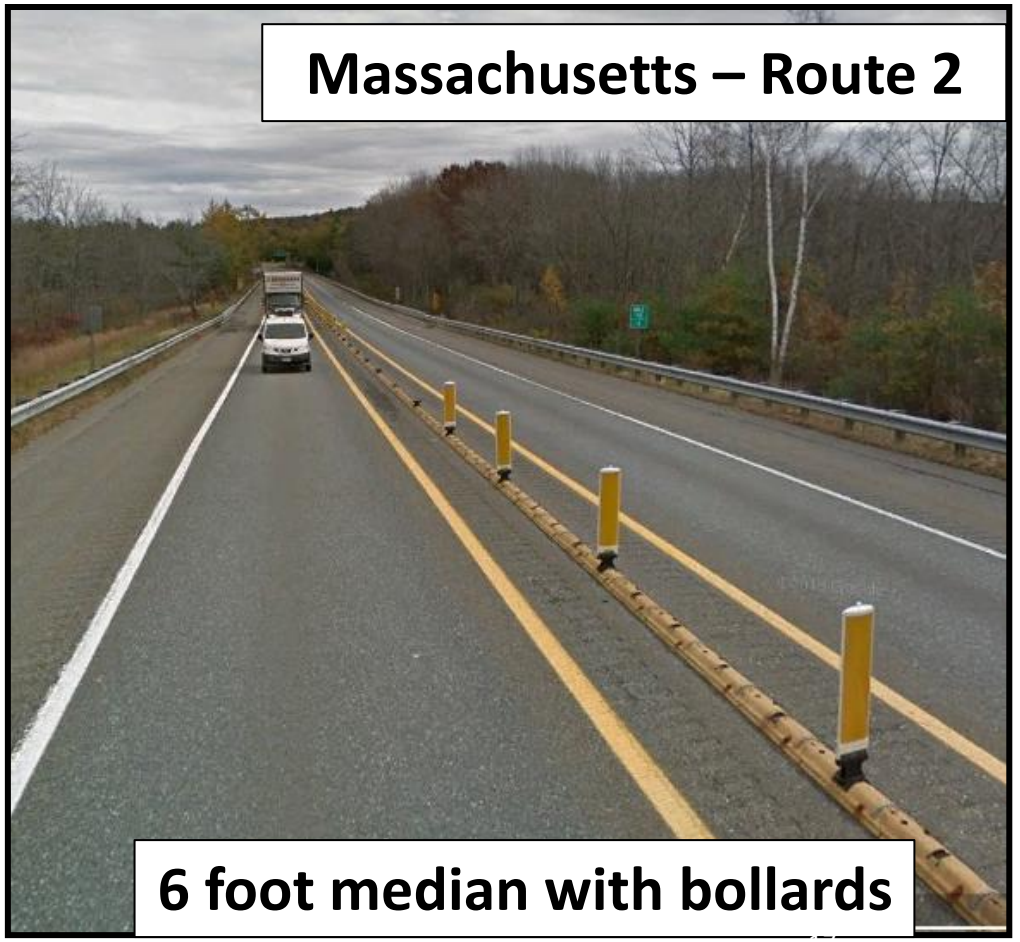
Medians
Passing lanes
Reduced conflict junctions

Defining Feature 1 - Medians



Median - Striped





Striped Median - New Zealand

U-turn on Route 2 in Clareville, New Zealand

Left side driving!

Striped median on Route 2 in Clareville, New Zealand

Median - Barrier

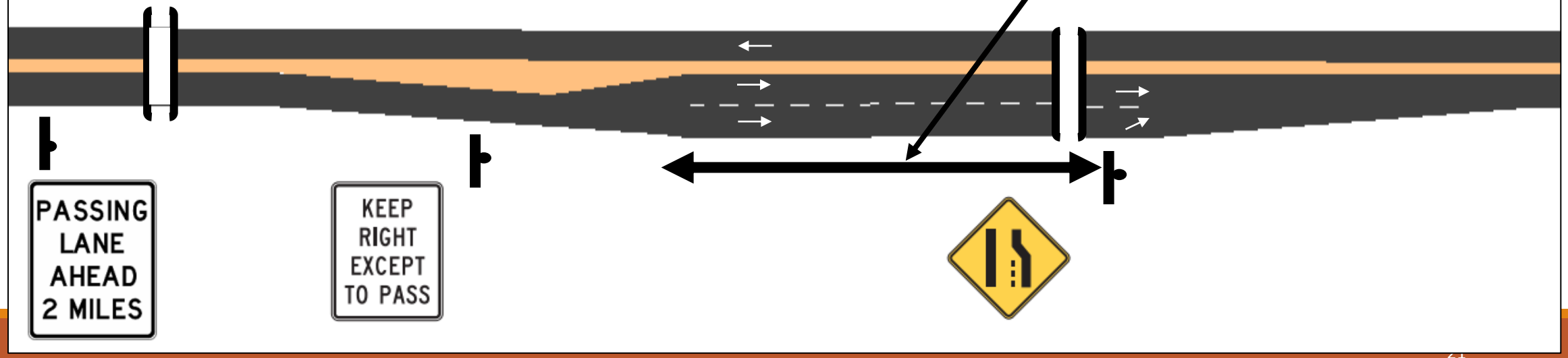
Median - Barrier

Defining Feature 2 - Passing Lanes

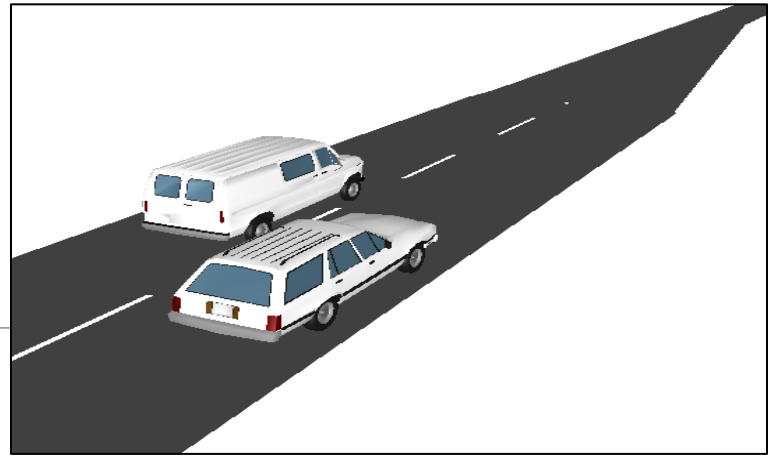
Direct all traffic into the right lane
End by dropping the right lane

Provide:
1. At regular intervals - based on traffic volumes and makeup
2. Leaving towns and other slow zones
3. On uphill grades

Length greater than 40 seconds of travel time at the speed limit



Passing Lanes



Why drop the right lane?

Drivers sit on left side of vehicles – in the right lane they are in a better position to see other traffic and adjust accordingly

If there is difficulty completing the merge, the vehicle on the right has the shoulder as an escape

With a left lane drop, the vehicle on the left may be forced into sudden braking, going into the median or into oncoming traffic

A right lane drop is identical to an entrance ramp entering a freeway and merging

Defining Element 3 – Reduced Conflict Junctions

Intersection designs to minimize conflict points

- **One to one simple conflicts** (unless signal controlled)
- **No median storage problems for long vehicles**
- **“Threats” only from the left or ahead, no “threats” from the right**

A “threat” to you, is from other traffic having the right-of-way

Reduced Conflict Intersections

MnDOT recently announced that they will no longer build 4 leg rural intersections with median openings allowing cross moves or left turns onto rural divided highways

- **Only J-turns or RCUTS**
- Signals, roundabouts and grade separations may be allowed at limited locations where traffic volumes justify

<u>That policy is consistent with the concept of the Super-2</u>

Super-2 - Junctions

Restricted Crossover U-turn or J-turn with 4 legs or 3 legs

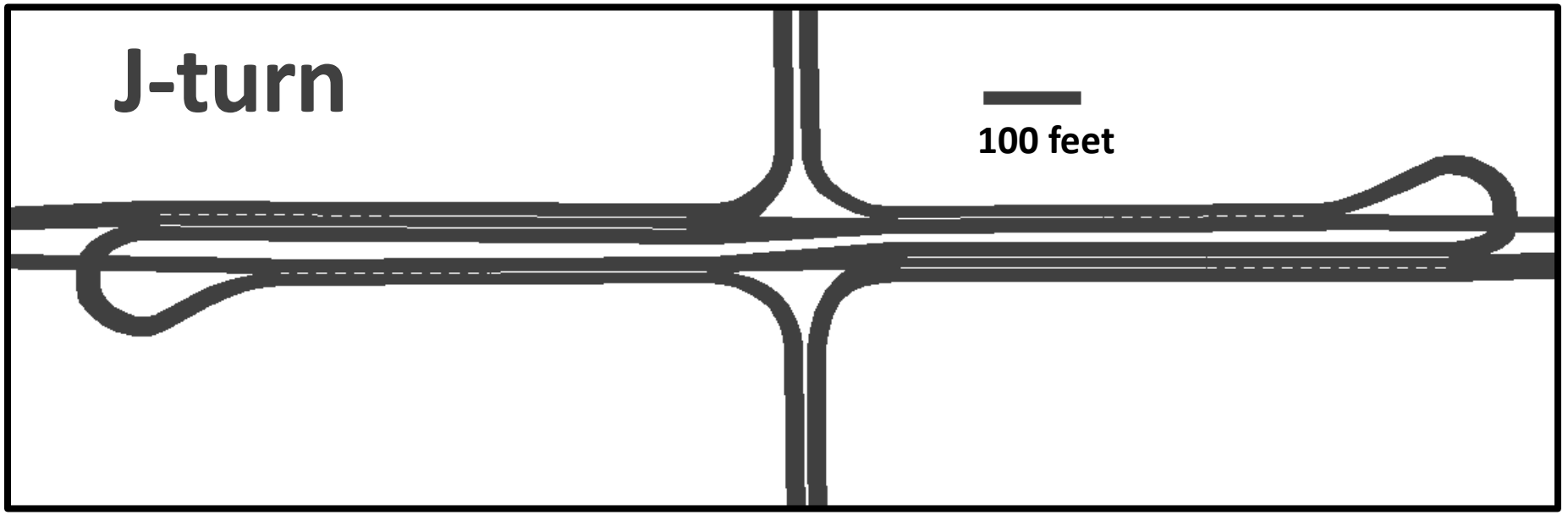
Through “T” intersection - with or without signals

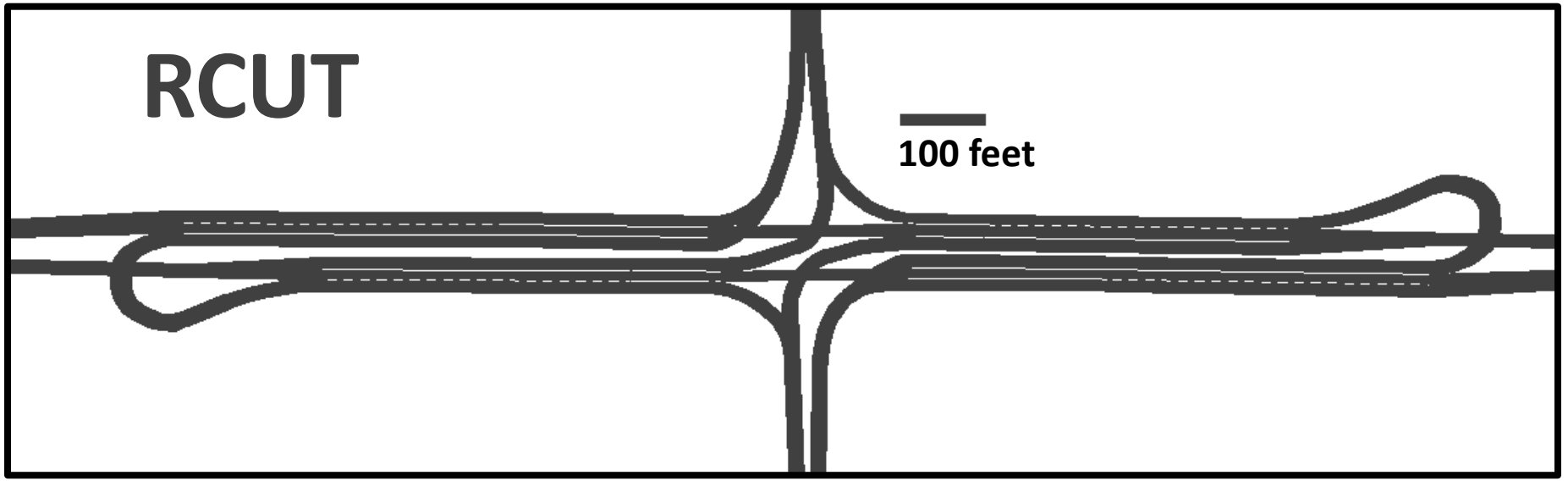
Roundabout

- Right turn bypasses where needed
- Optional auxiliary through lane

Intersection with signal

- Left / through / right on each approach
- Optional auxiliary through lane


J-turn
100 feet

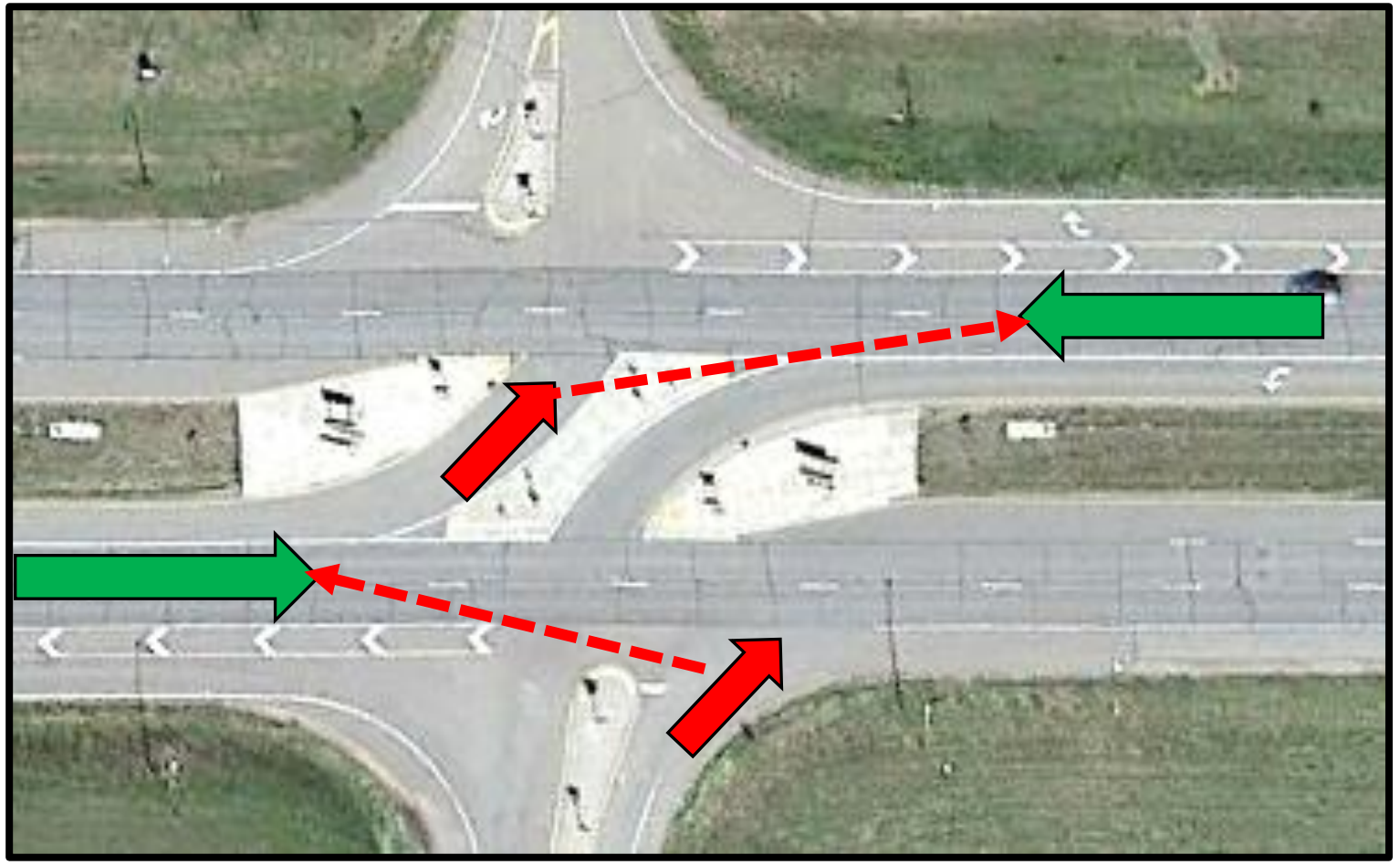

RCUT
100 feet

Reduced Conflict Intersections

One to one conflicts

RCUTs

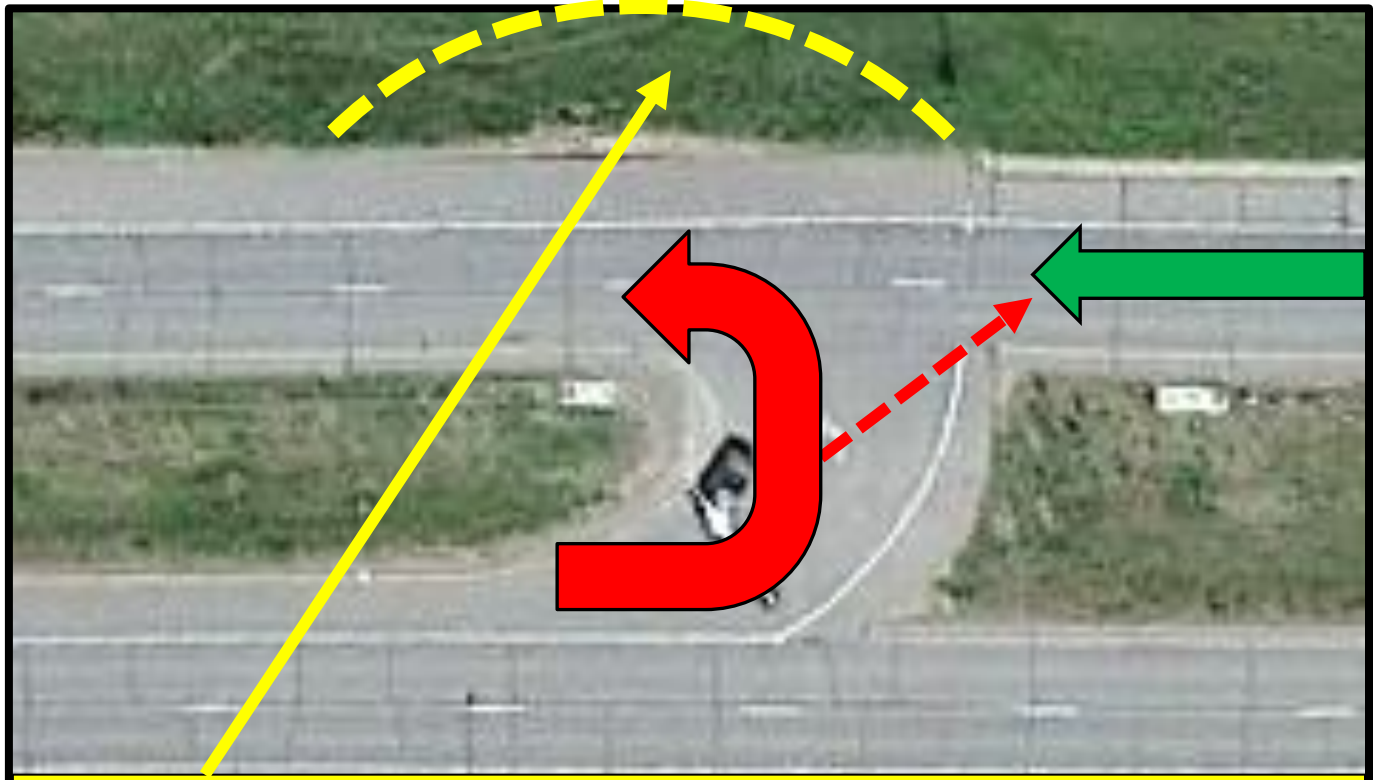
Lefts off and rights on



Reduced Conflict Intersections

One to one conflicts

J-turns or RCUT U-turns

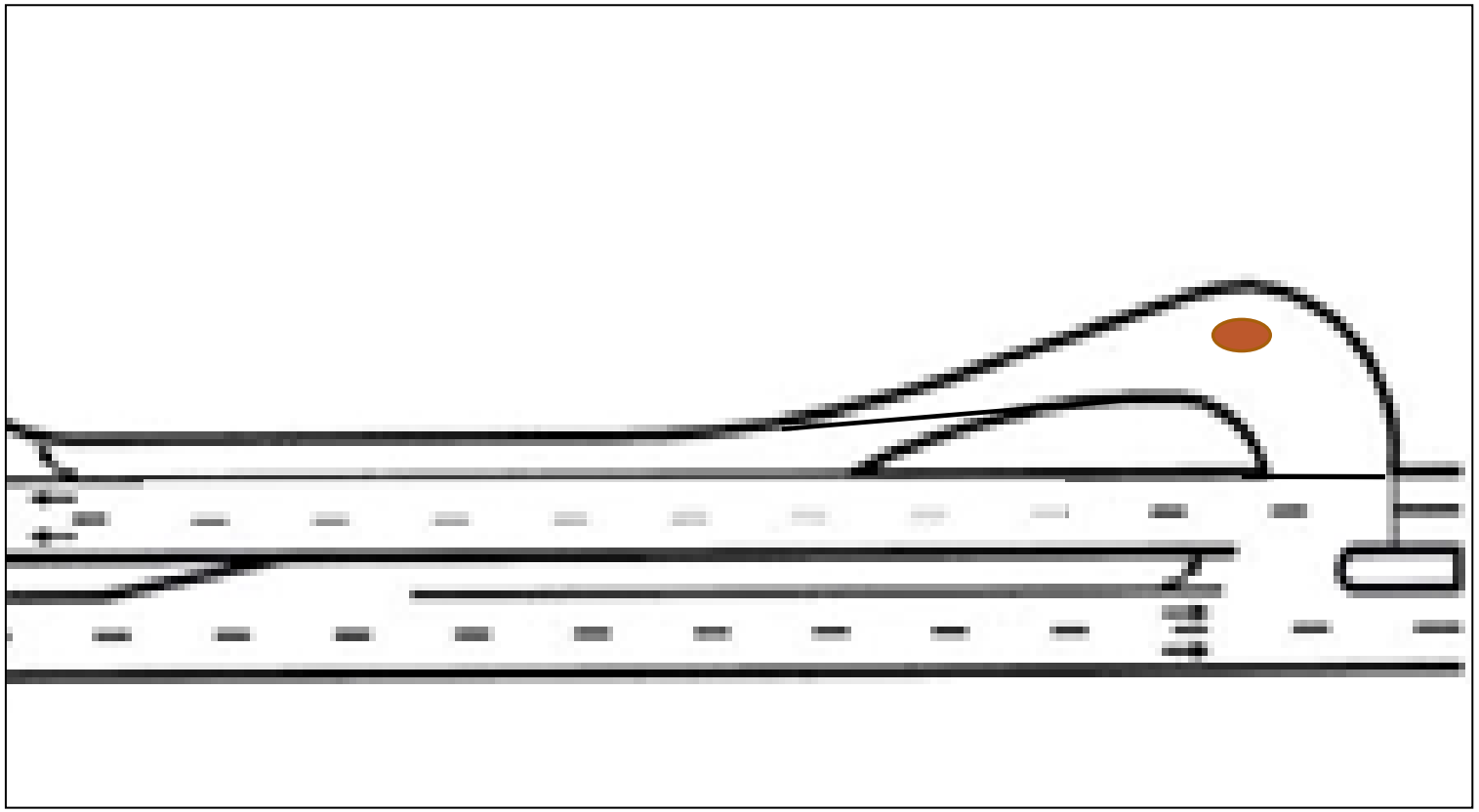


On a Super- 2, the narrow median will require a "loon" for large truck U-turns .

New Zealand U-turn – (reversed)

This shows a loon to accommodate trucks

Why are U-turn “bulb outs” called “loons”?

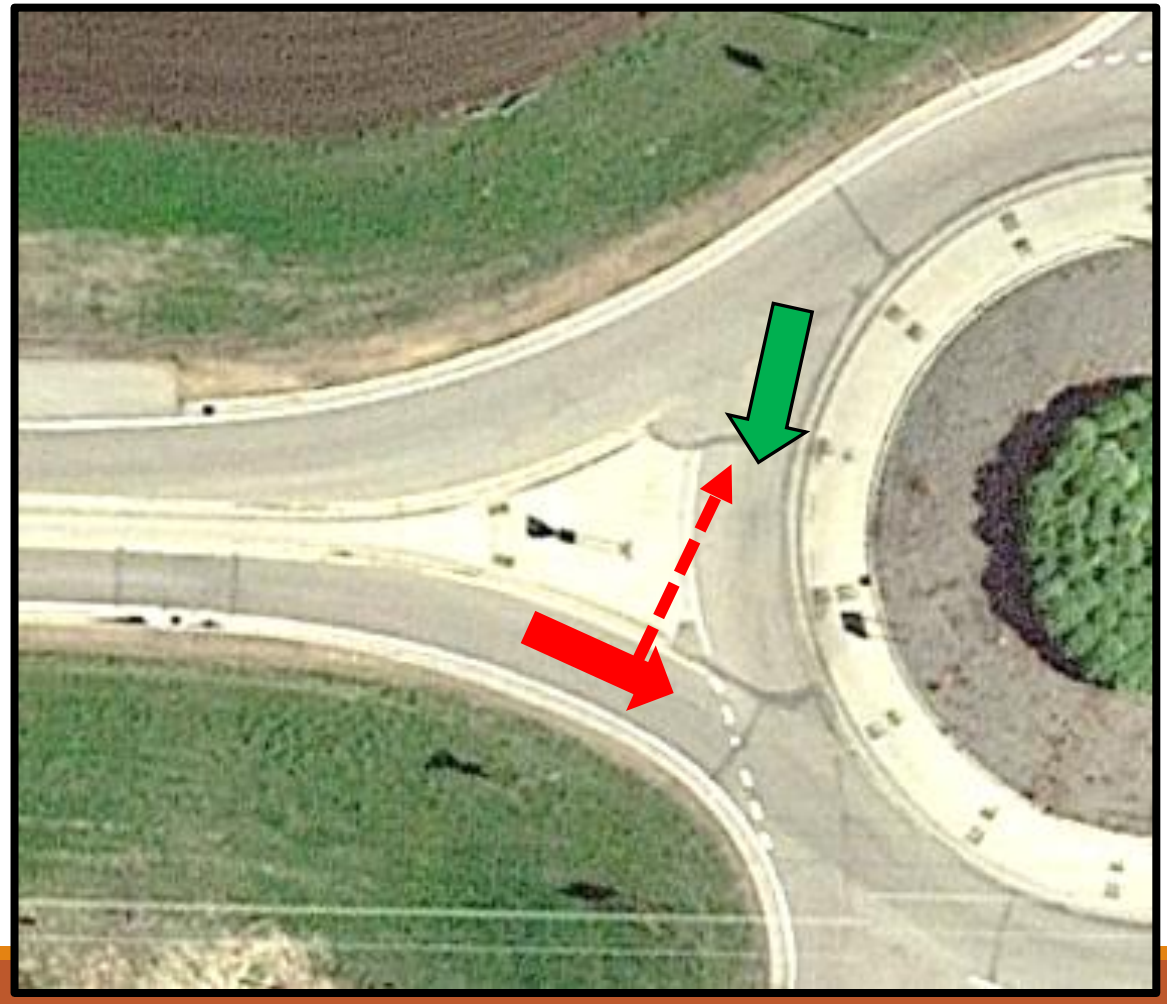


Reduced Conflicts

One to one conflict examples

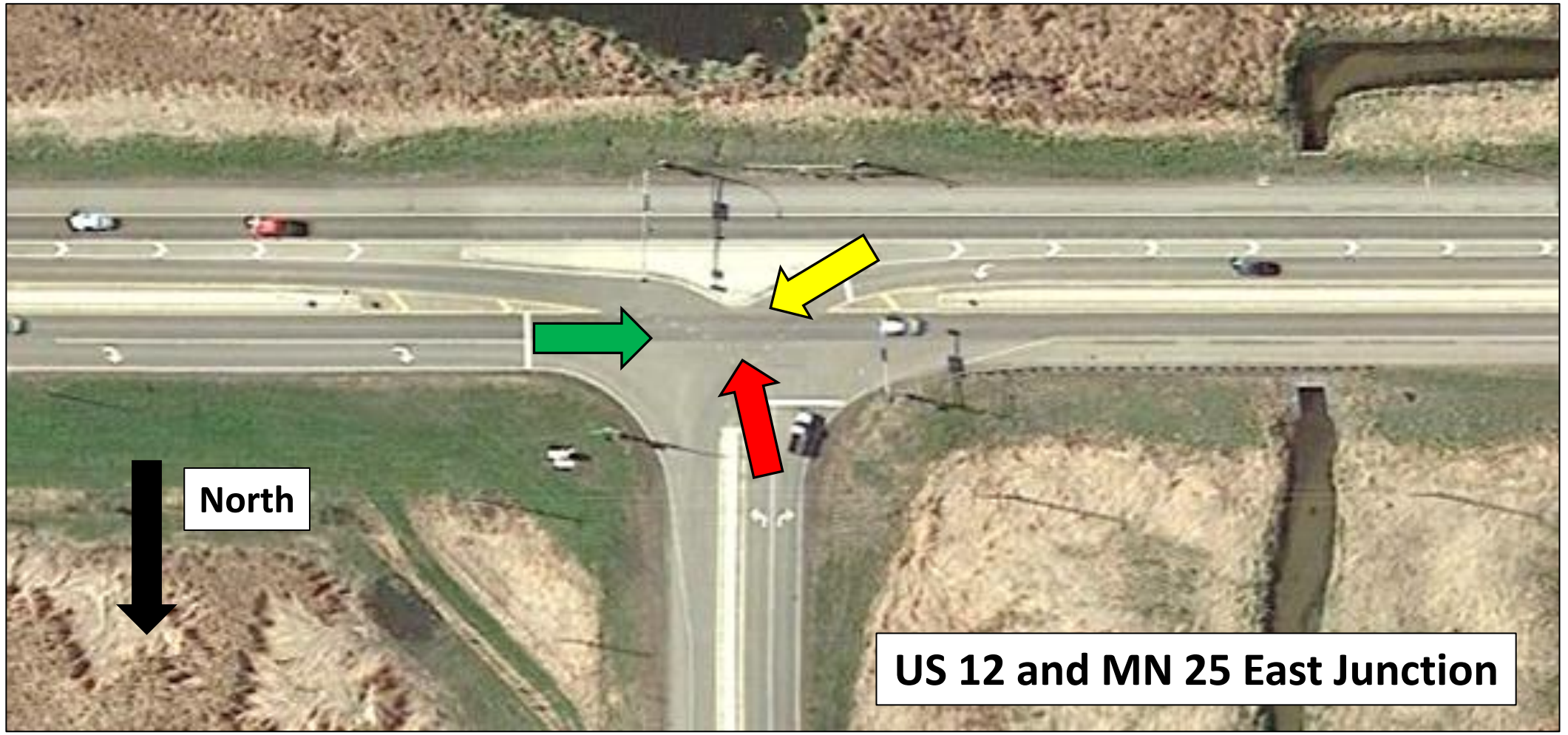
Roundabouts

Threats come from driver's side at low speed

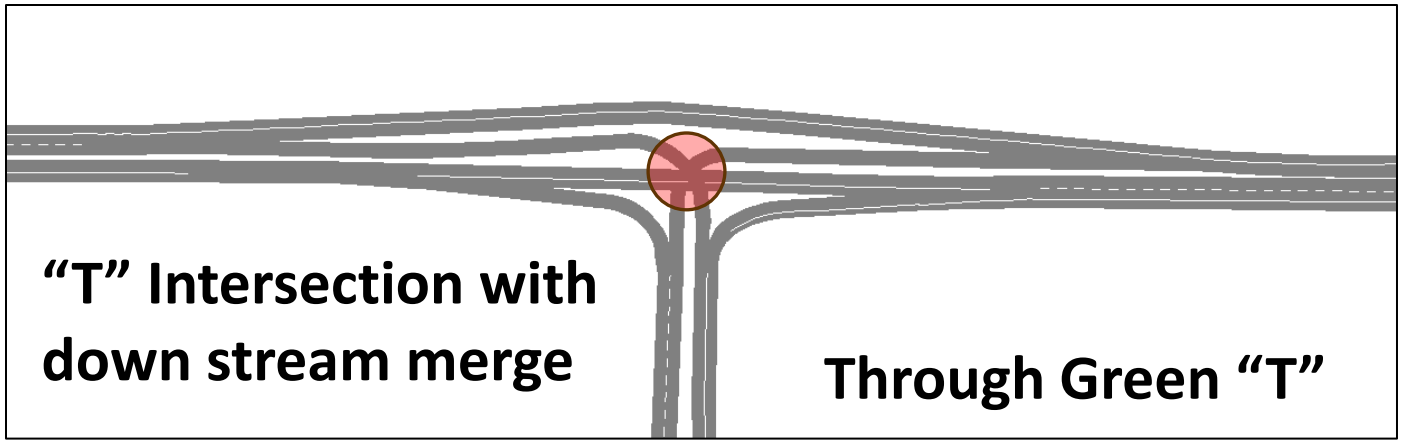


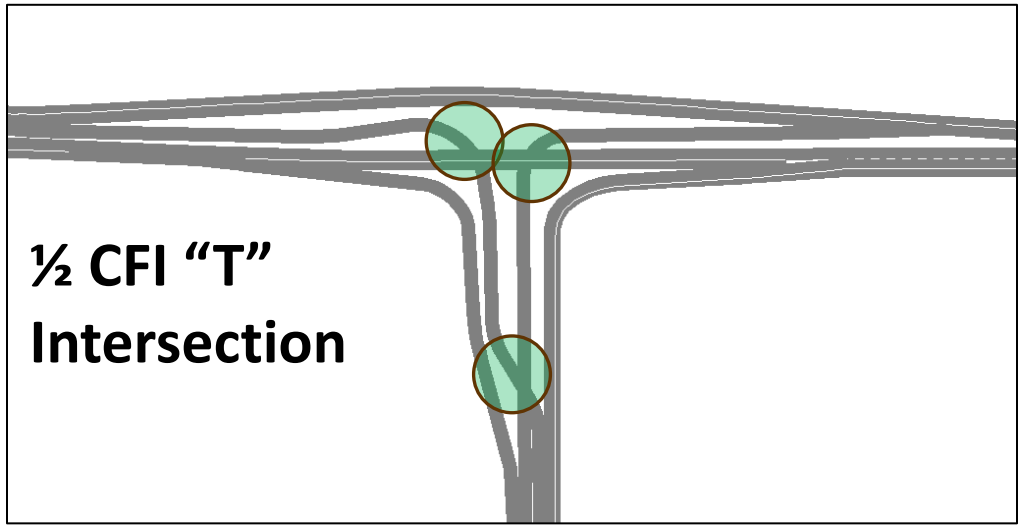
Through Green “T”

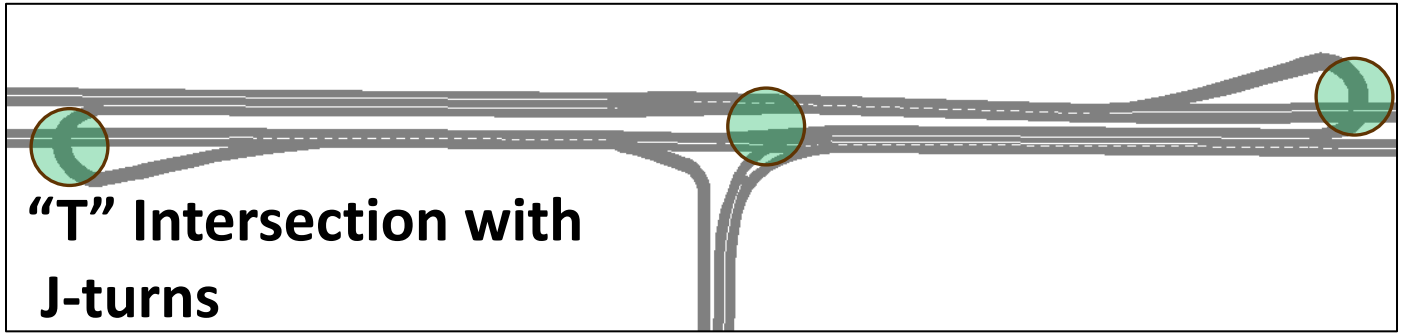
Side road driver has threats from two directions, but there is a signal



“T” Intersection Conflicts







Three way conflict point with threat from the right

Two way conflict point

Interchanges

Compact diamond

- Ramp intersection roundabouts or STOP signs

Quadrant

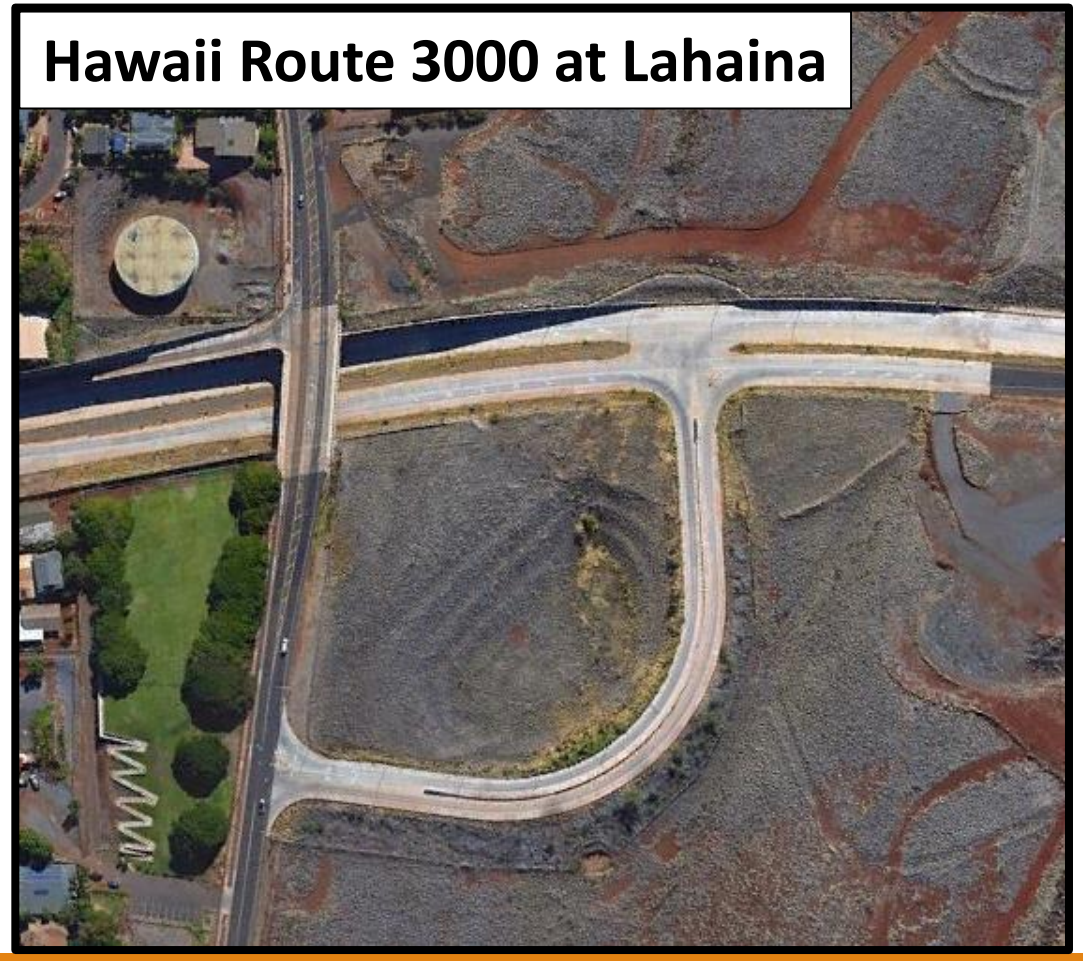
- Roundabouts or RCUT “T” intersections on the major roadway

“T” Interchanges

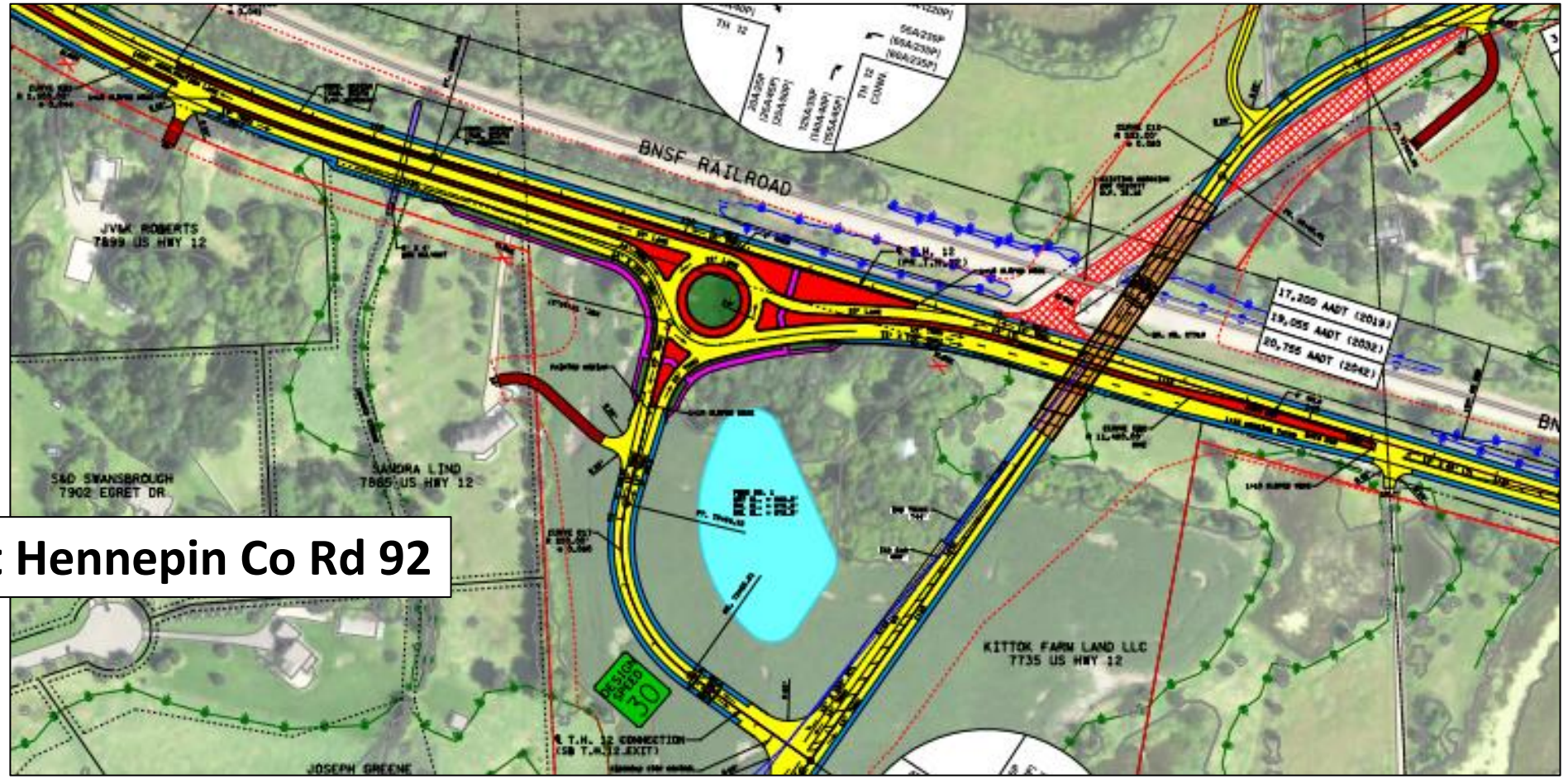
- ½ diverging diamond

Four entrance ramp “windmill”

Quadrant Roadway Interchange

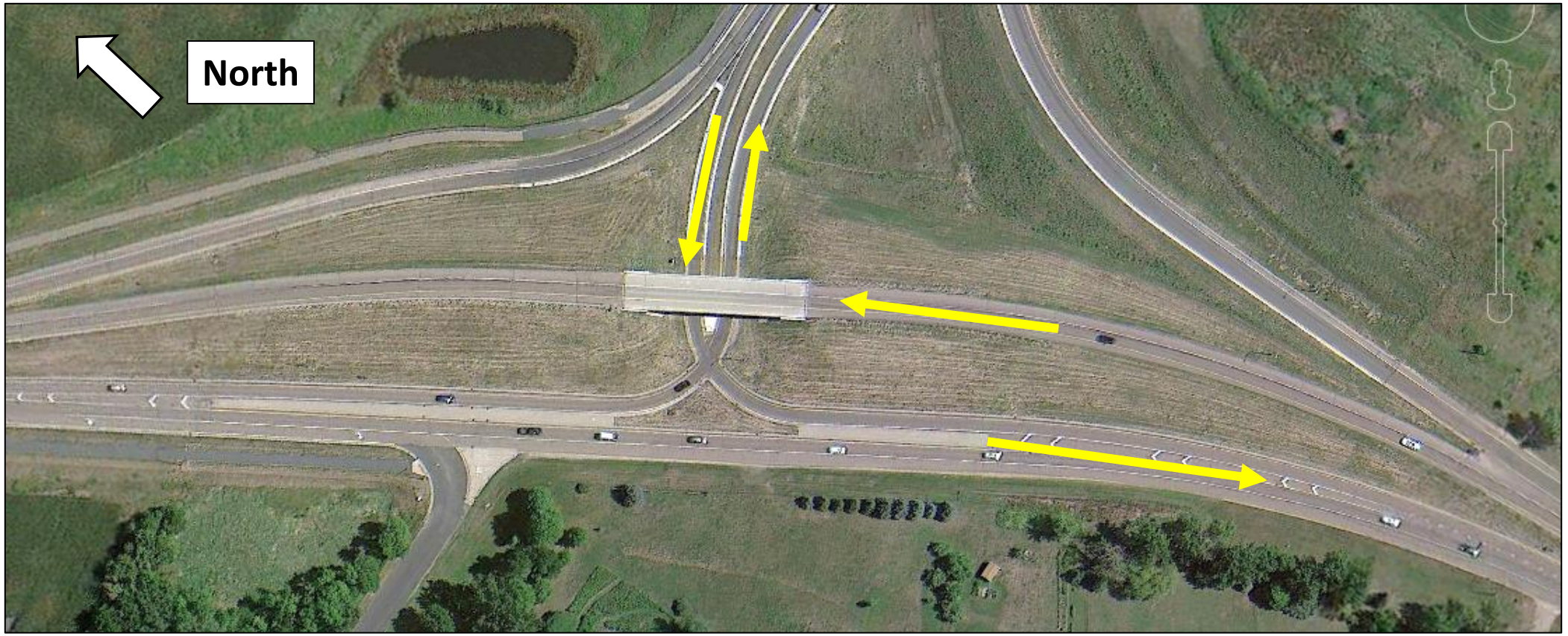


Quadrant Roadway Interchange

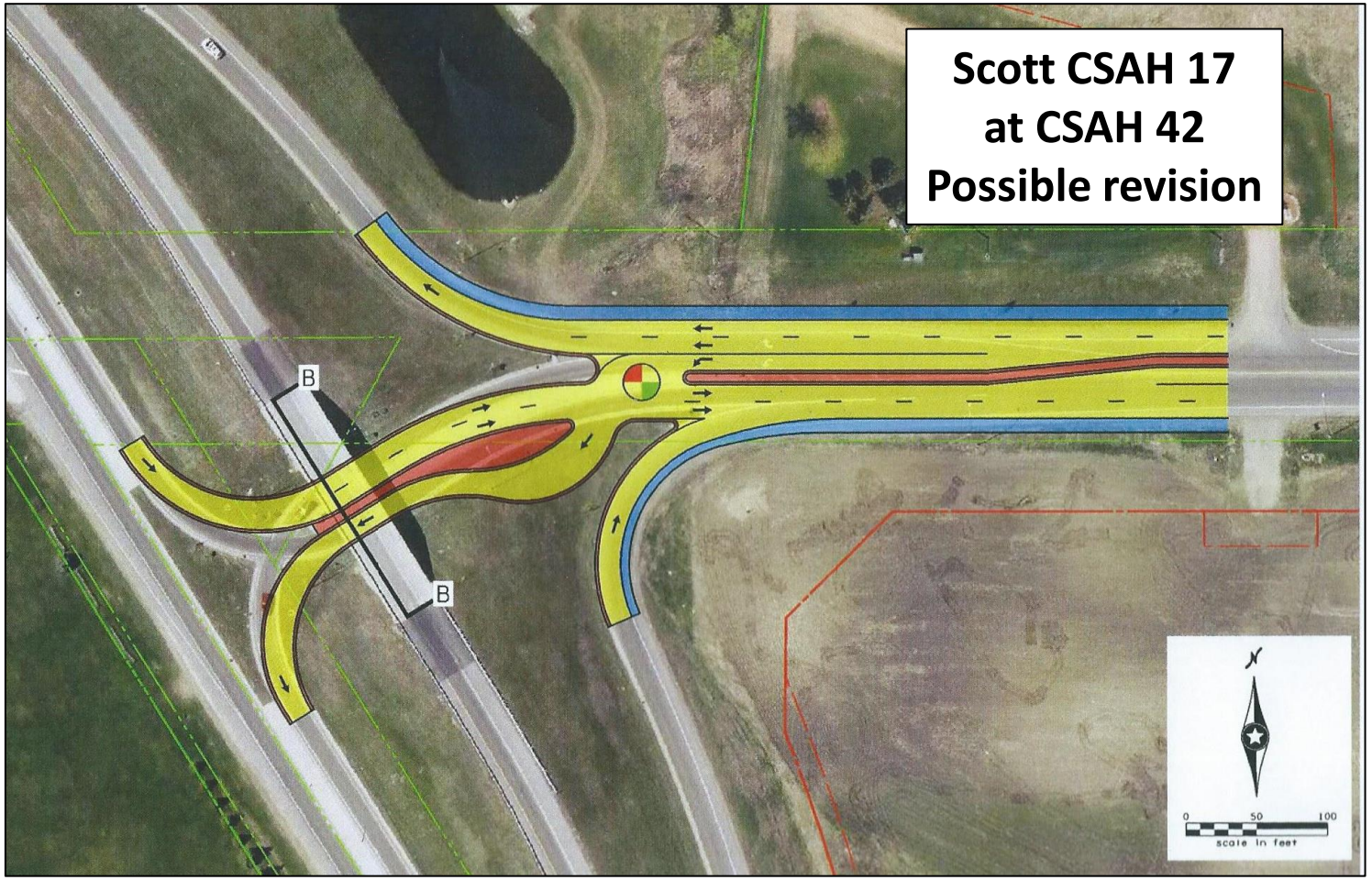


US 12 at Hennepin Co Rd 92

High “T” Scott Co Rd 17 at Co Rd 42

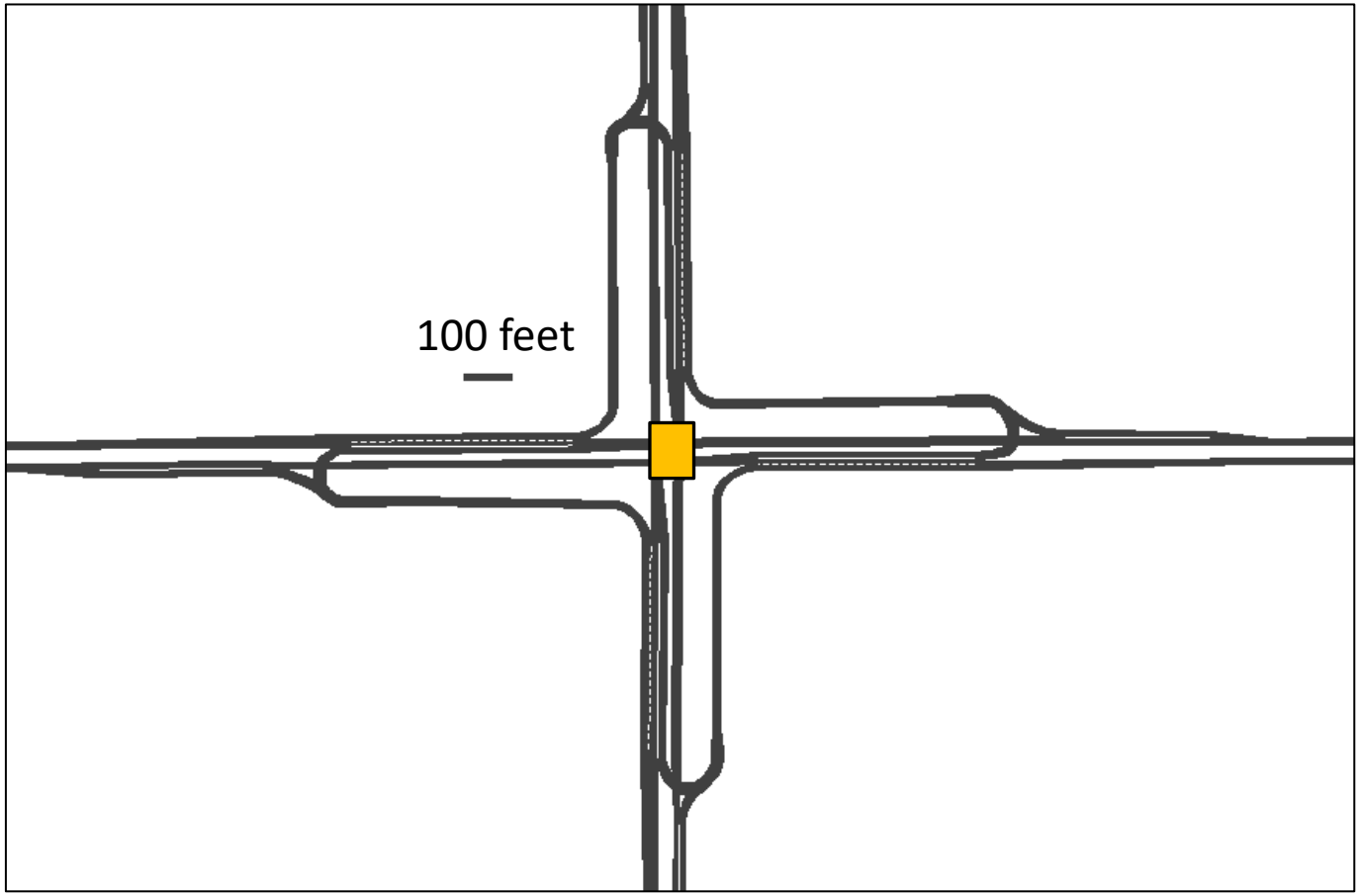


½ DDI or High “T” Alternative



B-W Parkway at Arundel Mills in MD

Interchanges – The 4 J-turn or Windmill

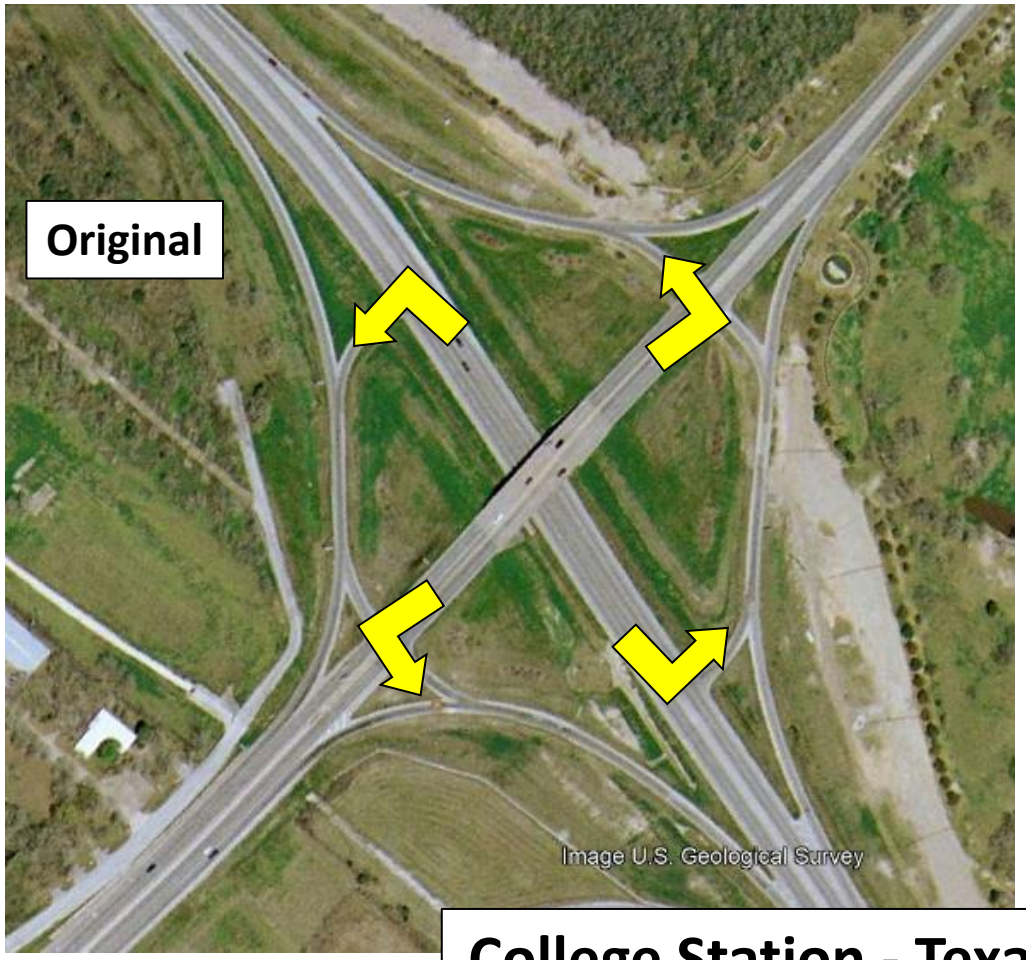


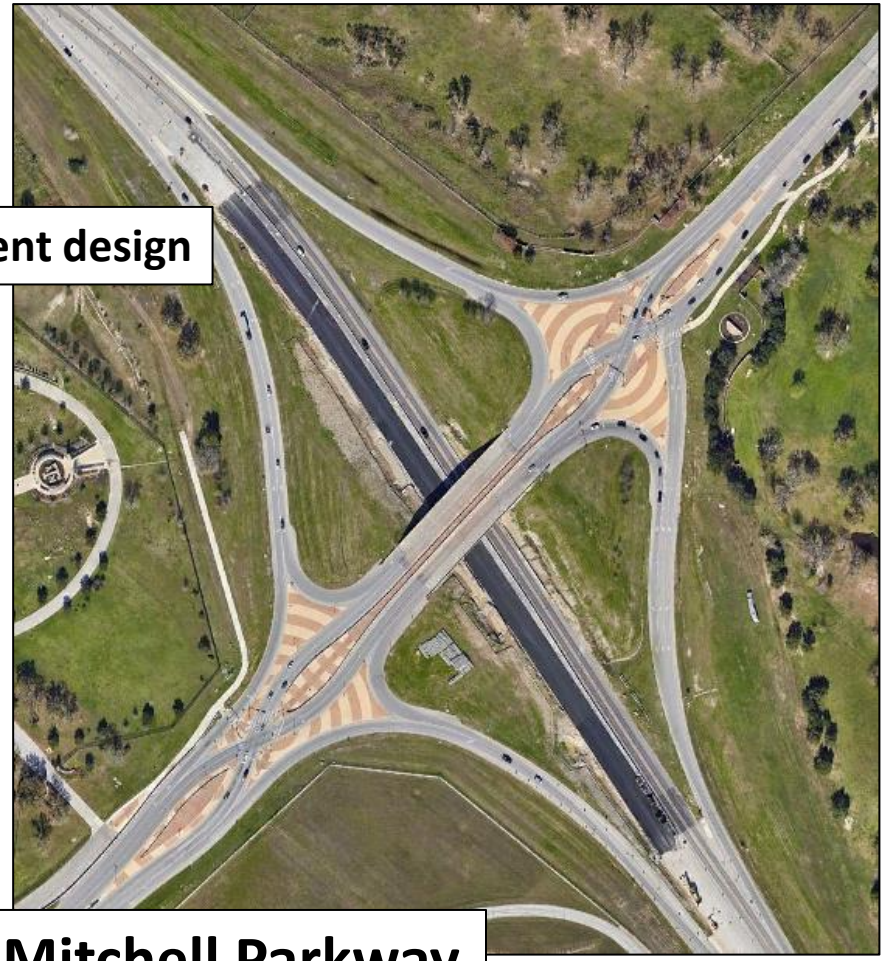
Possible use at the junction of two Super-2's

All conflict points are 1 to 1

1. **Through traffic on both roadways has priority**
2. **Left turns yielding to through**
3. **Right turns yielding to left turns**
4. **Entering right turns merging with through traffic**

Interchanges – Windmill





College Station - Texas 47 at Harvey Mitchell Parkway

Is US-1 in Florida a Super-2?

Previously a 4 lane undivided roadway

High crash rate with many severe crashes

Median barrier added – reduced to one lane per direction

20 miles long - 3 passing lanes per direction

Very limited roadside access

7 “T” intersections with through bypasses and lefts to add lanes

3 - very compact interchanges

AADT = 28,000

US-1 - Median Barrier

US-1 – “T” Intersection

Compact Interchanges

US-1 in Florida

US-1 - Compact Interchanges

Where do we go from here?

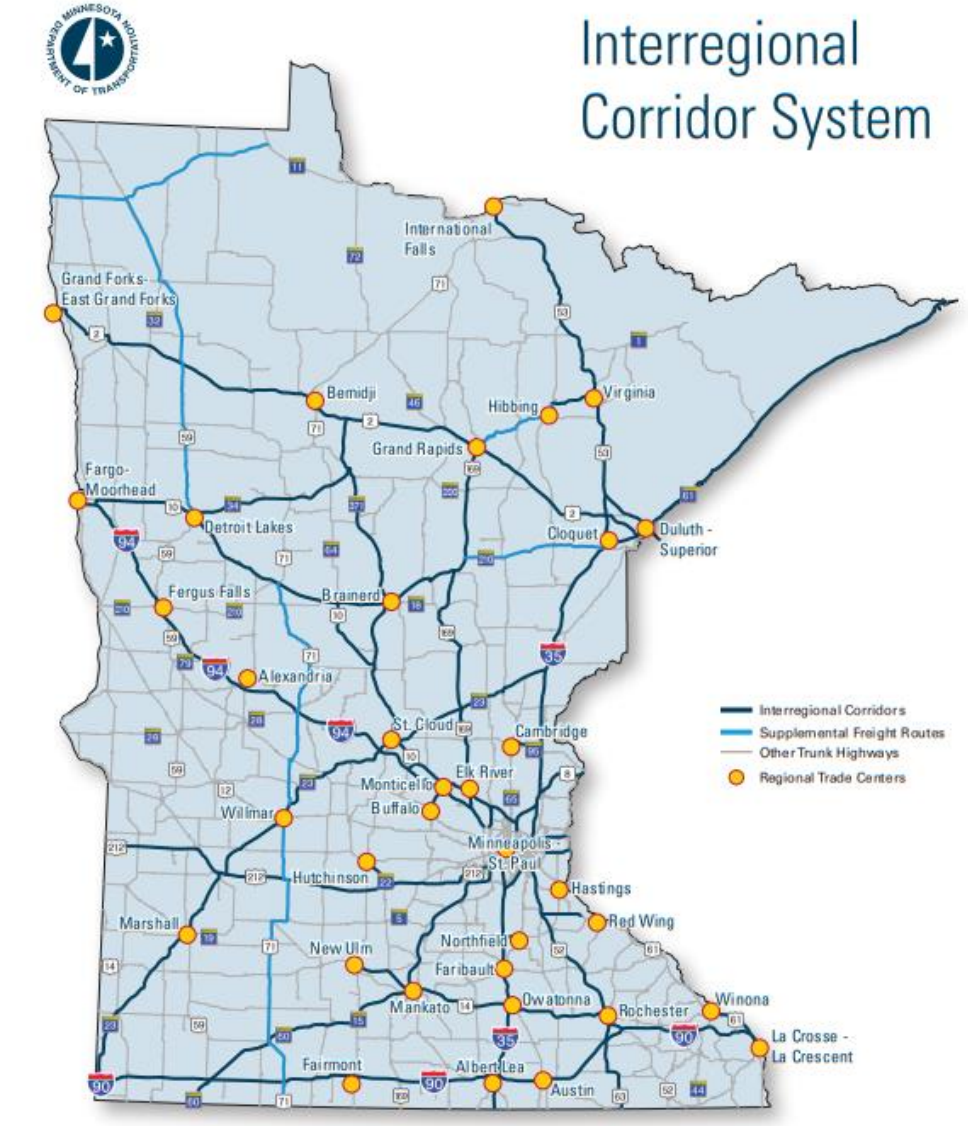
Research is needed

- To determine which median design to use for each situation
- Placement and design of passing lanes
- How to select the best junction designs

The best designs and methods of operation when signals are needed

The Super-2 should be designed to handle 20 year forecasts, but after that, can it be easily expanded?

Where do we go from here?



<u>What are candidate roadways in Minnesota?</u>

Two lanes roads which are currently part of the Minnesota Interregional Corridor System.

Two lane roads with recreational traffic

Commuter routes

Where do we go from here?

Opportunities to build a complete Super-2 corridor are limited

Short segments of Super-2 can increase safety and capacity and serve as early phases for future upgrading a corridor

Existing two-lane roadways where access management is not complete, elements of the Super-2 could be used

- Intersection designs
- Medians - minor access points become right on right off. Traffic goes to the nearest intersection designed to handle U-turns

Adding Signals to RCUTs and J-turns

RCUTs offer flexibility for adding signals

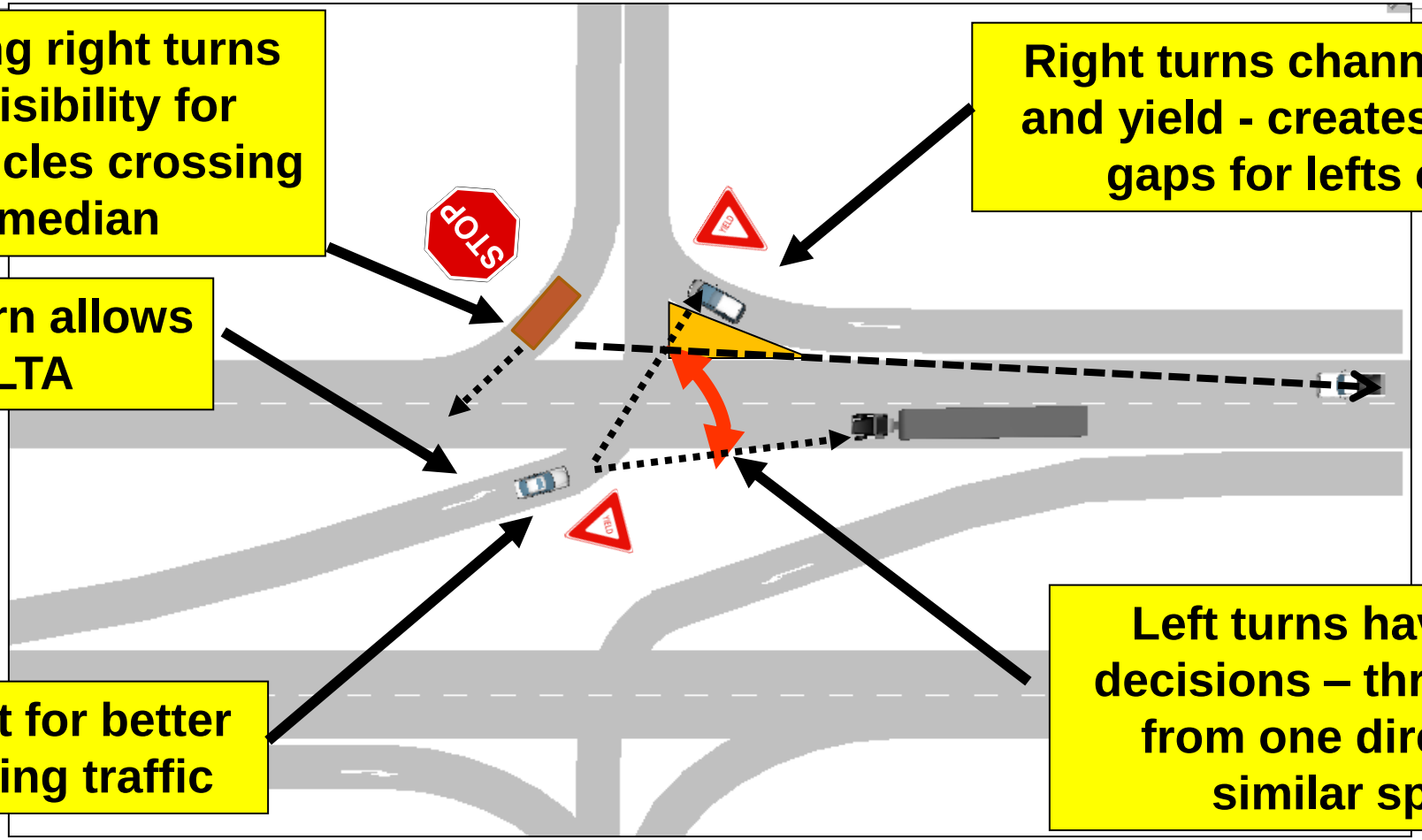
- Only 2 or 4 “nodes” - each with only 2 conflicting phases
- Only nodes needing signals would have them. Others remain with YIELD or STOP control.
- Signals in each direction can be timed as a one way street.
- FYLTA can be used for U-turn & left turn movements. GLTA called by delay or queue length.
- The signals would rest in mainline green and FYLTA

However at the RCUT with signals at MN 65 and Co Rd 22 in Anoka County

Mainline left turns are “bent” to become 90 deg. moves, not lefts

Side street approaches are dual right turns with “No Turn On Red”

RCUT Geometry for Demand Based Signals



Offset exiting right turns improve visibility for entering vehicles crossing to the median

Right turns channelized and yield - creates more gaps for lefts off

Keeping it a left turn allows for use of FYLTA

Left turns offset for better view of oncoming traffic

Left turns have easier decisions – threat comes from one direction at similar speeds

Evaluation of Junction Designs

VISSIM used to collect travel times for each of the 12 movements

- **J-turn**
- **RCUT**
- **Intersection with a signal**
- **Roundabout**

Volumes - both peak hour and 8th highest hour of an intersection meeting signal Warrant 1B - “interruption of continuous traffic”

The results for the 8th highest hour indicate what could be happening for the remaining 16 hours of the day

Peak Hour Travel Times

Peak Hour Travel Times	J-turn	RCUT	Intersection With Signal	Roundabout	At-grade diamond	At-grade loops
Total Travel Time (hours)	27.8	27.1	27.1	27.3	26.7	27.5
Average Travel Time For All Vehicles (seconds)	82.2	79.9	80.3	80.7	79.1	80.6
Average Travel Time For Mainline Through Vehicles	70.1	70.3	77.4	81.1	75.5	75.6
Travel Time For Left Turns From M.L.	121.3	84.0	91.2	80.1	107.8	116.2
Travel Time For Minor Street Through	144.1	142.1	98.7	81.9	88.1	88.2

8th Highest Hour Travel Times

	J-turn	RCUT	Intersection With Signal	Round-about	At-grade diamond	At-grade loops
Total Travel Time (hours)	15.0	14.6	14.5	14.4	15.0	15.1
Average Travel Time For All Vehicles (seconds)	79.9	77.8	76.9	79.0	75.9	76.8
Average Travel Time For Mainline Through Vehicles	68.5	68.4	73.8	78.5	71.7	71.4
Travel Time For Left Turns From M.L.	119.4	85.1	83.4	81.0	103.3	114.1
Travel Time For Minor Street Through	135.1	134.7	93.9	79.8	86.1	86.4

THE END

Email: Dennis_Eyler@yahoo.com

For best results - never drop the left lane!

ACEC/WisDOT Transportation Improvement Conference
Pointing to the Future

March 9-10, 2009
Revised in 2025

Alternate Intersection Designs

Traffic Operations

Dennis R. Eyler, SRF Consulting Group, Inc.

INNOVATIVE INTERSECTION DESIGNS

Wisconsin ACEC Meeting
March 9, 2009
Stevens Point

Dennis Eyler, P.E., P.T.O.E.

Vice President

SRF Consulting Group, Inc.

Presentation Goals

- Show examples of designs
  - Already in use
  - Designs being considered
- Explain features and issues
- Increase interest in their use
  - If not in whole, consider some features
- Provide contacts for information

Why New Designs?

Divided highway intersections often have problems

New designs needed to:

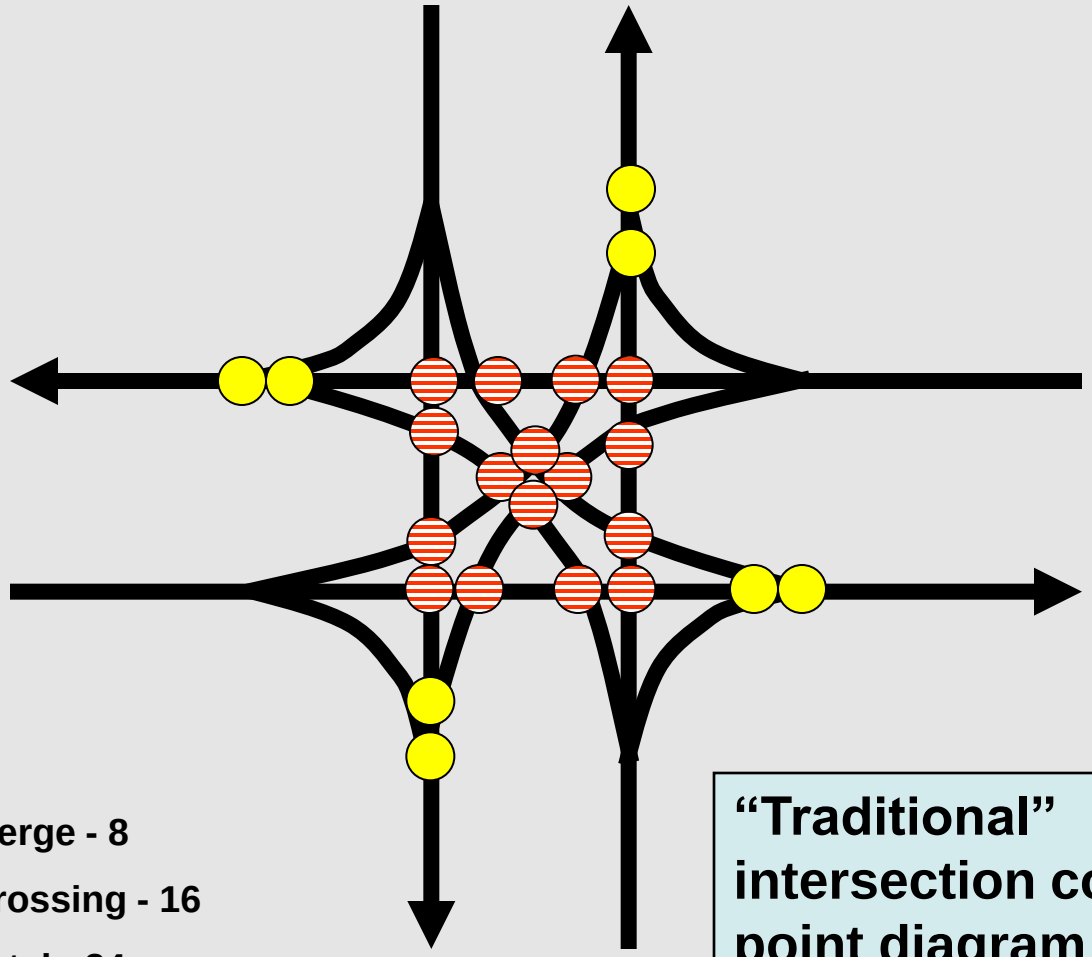
- **Improve safety**
- **Help manage access**
- **Reduce need for signals**
  - **Improve mobility**
  - **Reduce user costs**

Several studies have been completed

Expressway Intersection Safety NCHRP 15-30

Slide - courtesy of Tom Maze – Iowa State CTRE

The problem:
Too many conflict points



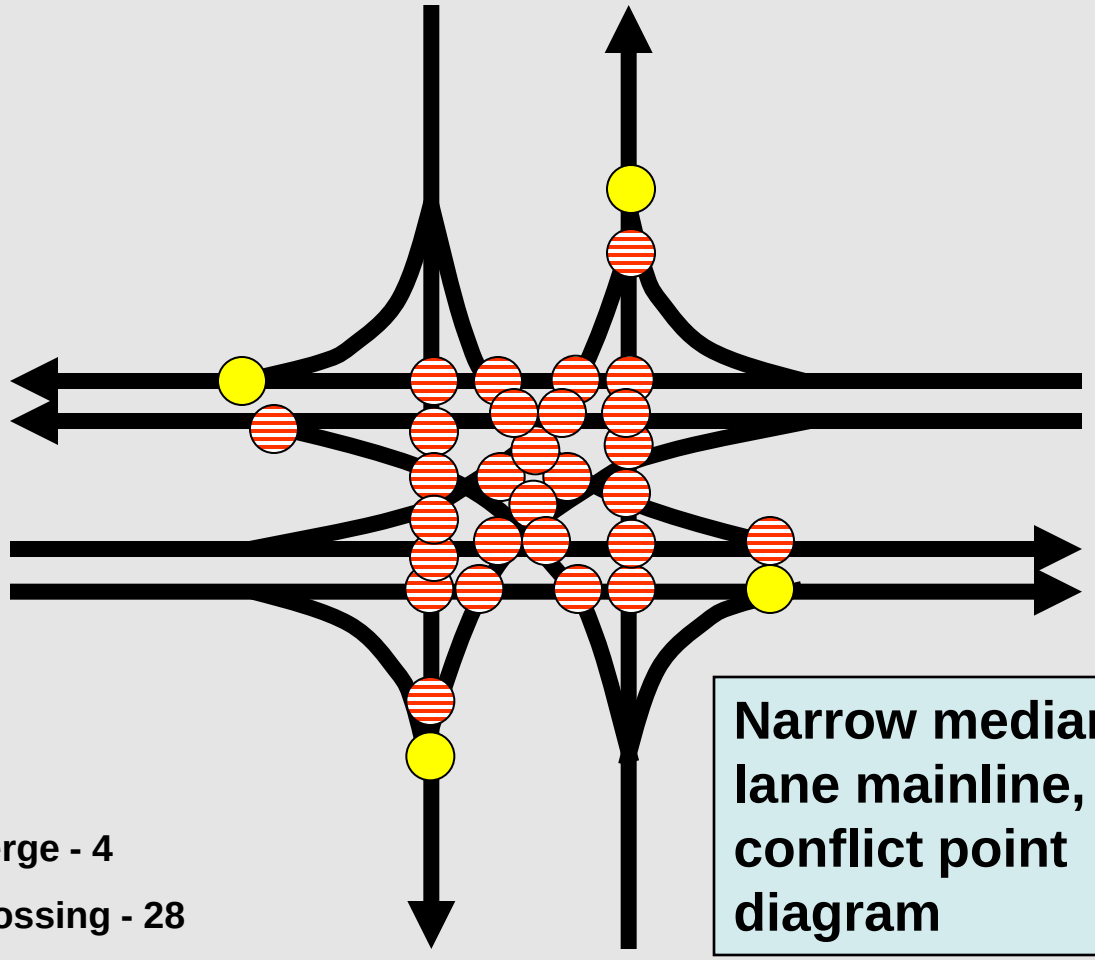
Merge - 8

Crossing - 16

Total - 24

“Traditional” intersection conflict point diagram

However, it's actually worse



Merge - 4

Crossing - 28

Total - 32

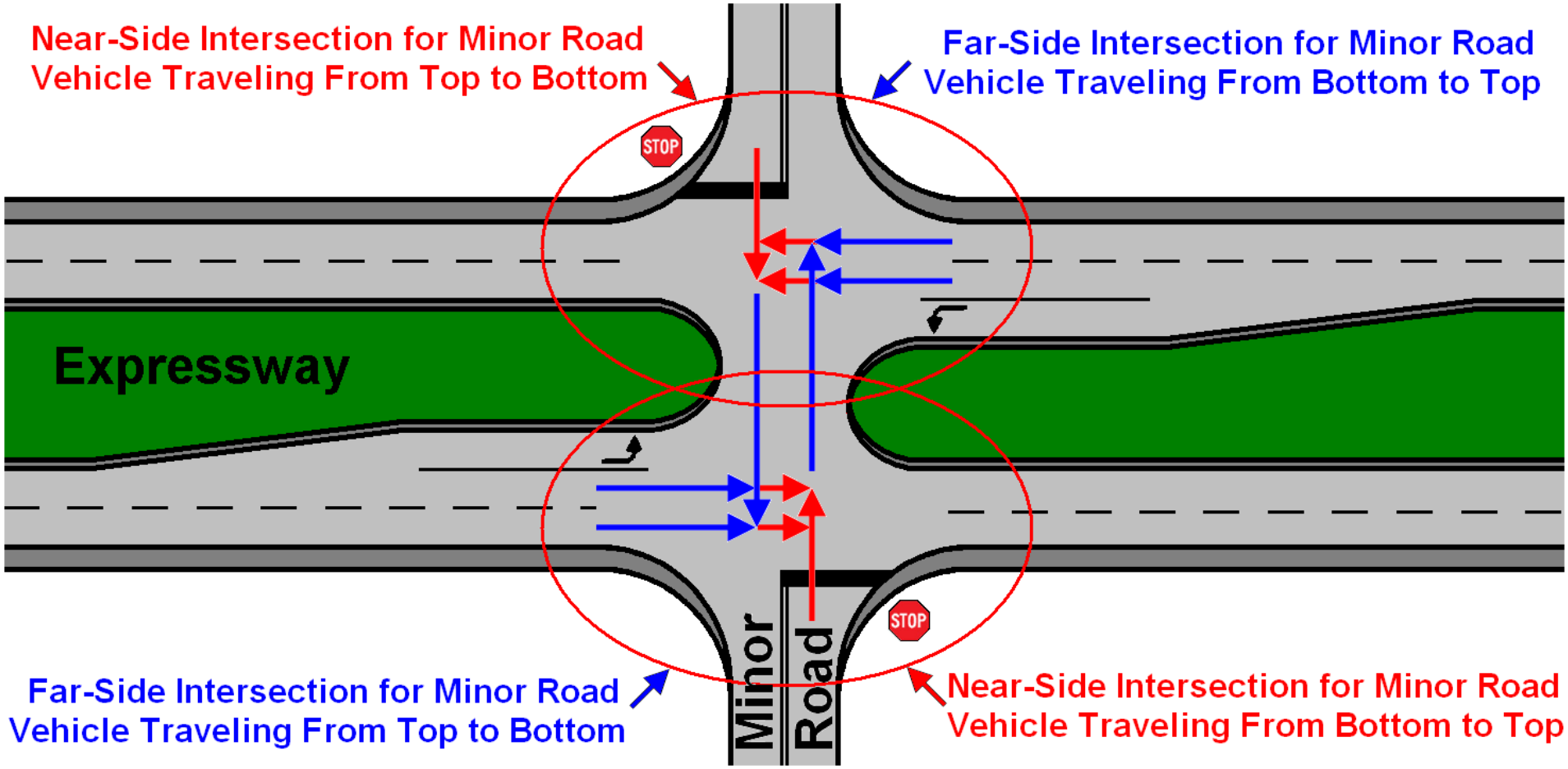
Narrow median four lane mainline, conflict point diagram

What are the operations problems with existing designs?

- **Too many crashes**
- Too many conflict points

Far-Side Right-Angle Crashes

More of a problem (62% to 38%)

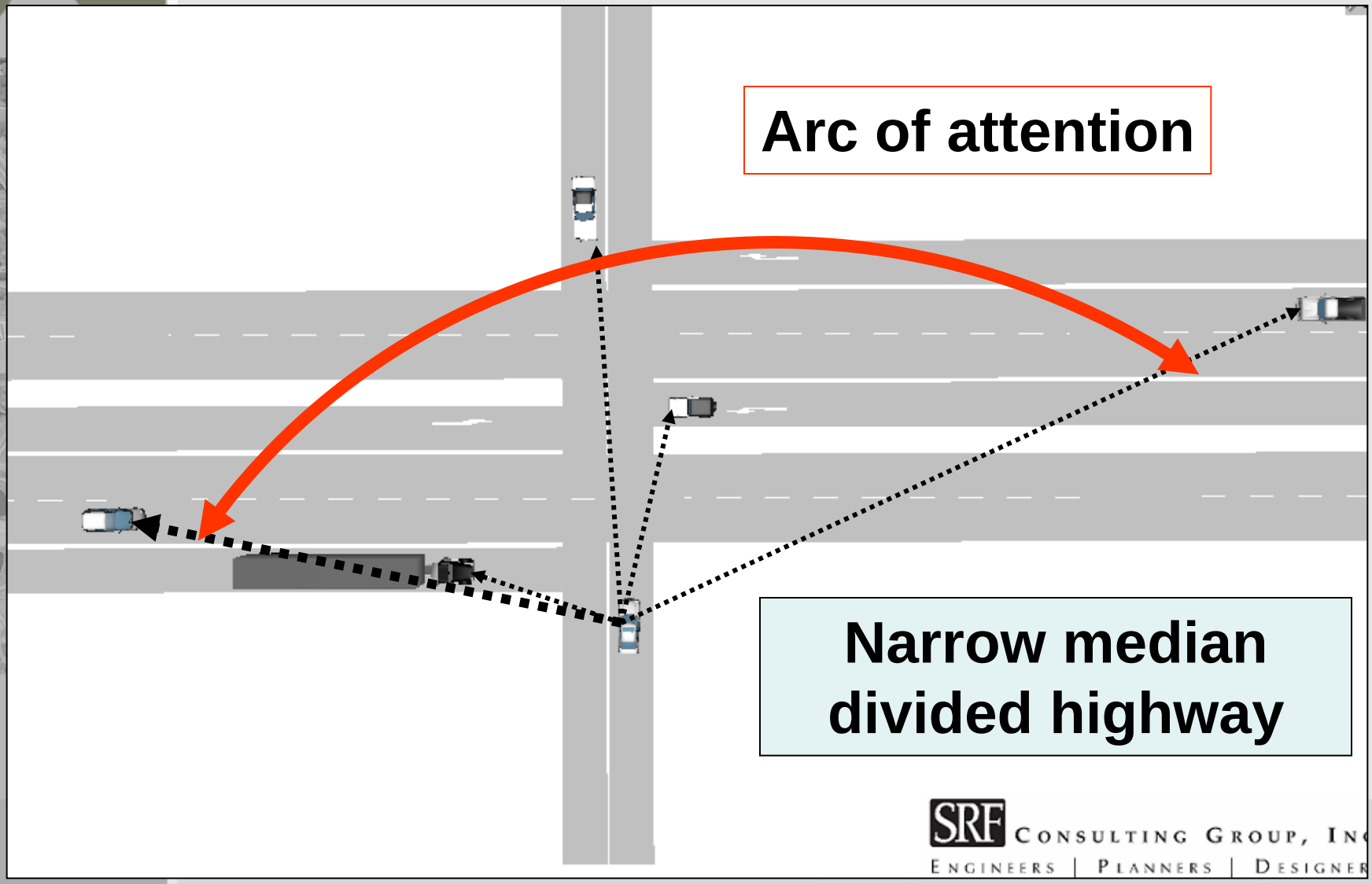


Slide - courtesy of Tom Maze

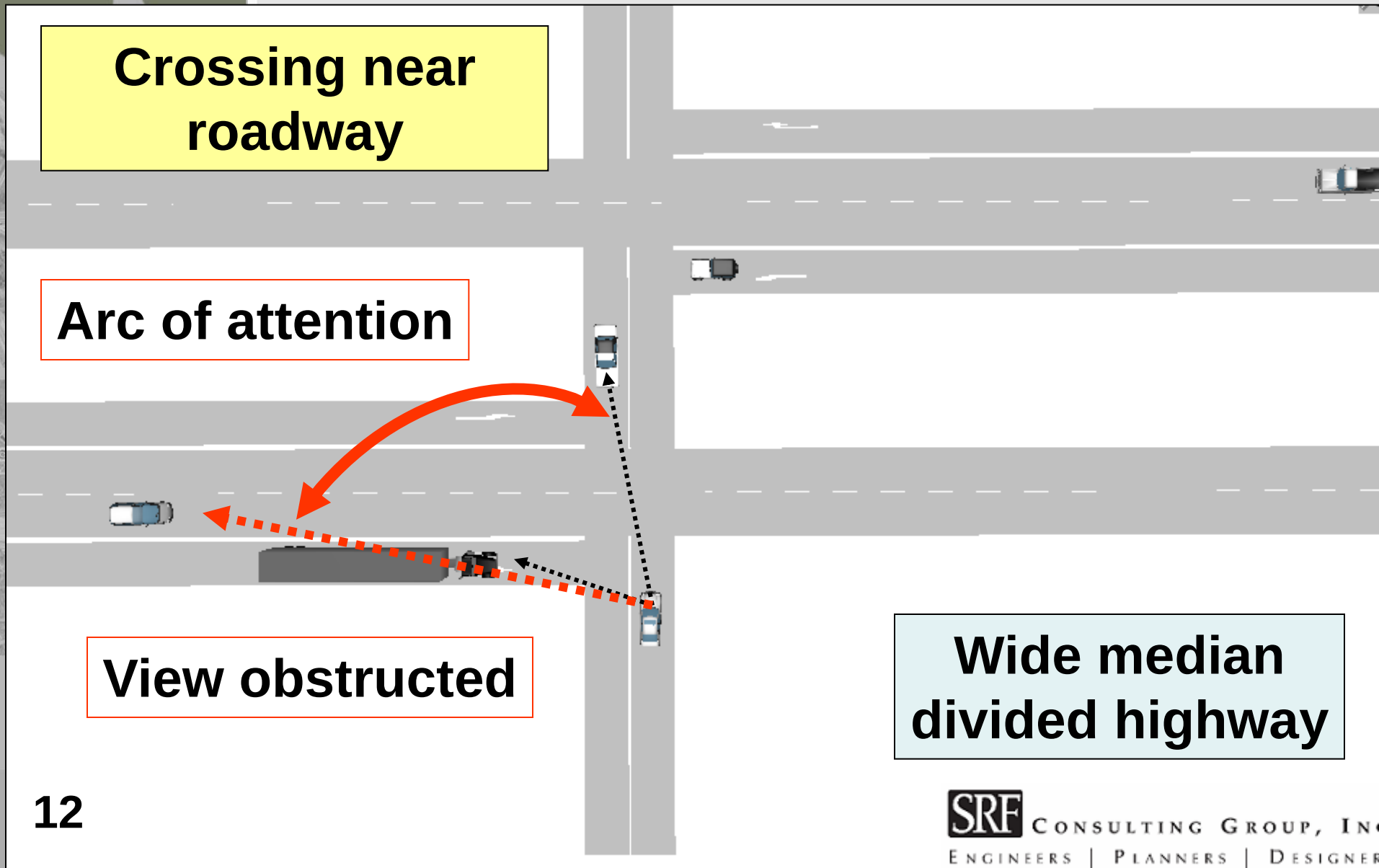
What are the problems with existing designs?

- **Driver overload – difficult decisions**
- Too many conflict points
- Too many crashes

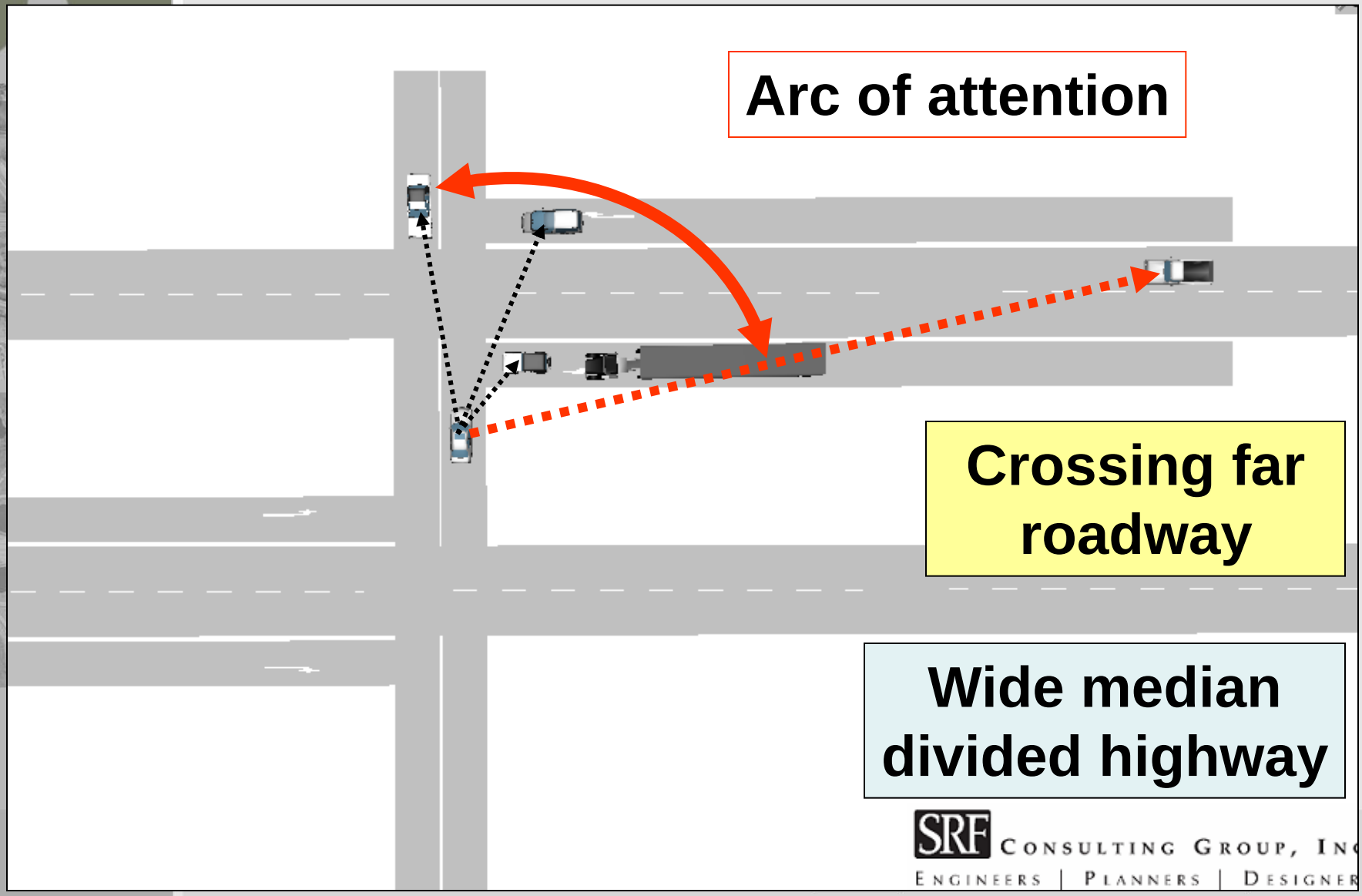
Driver overload?



Driver load reduced?



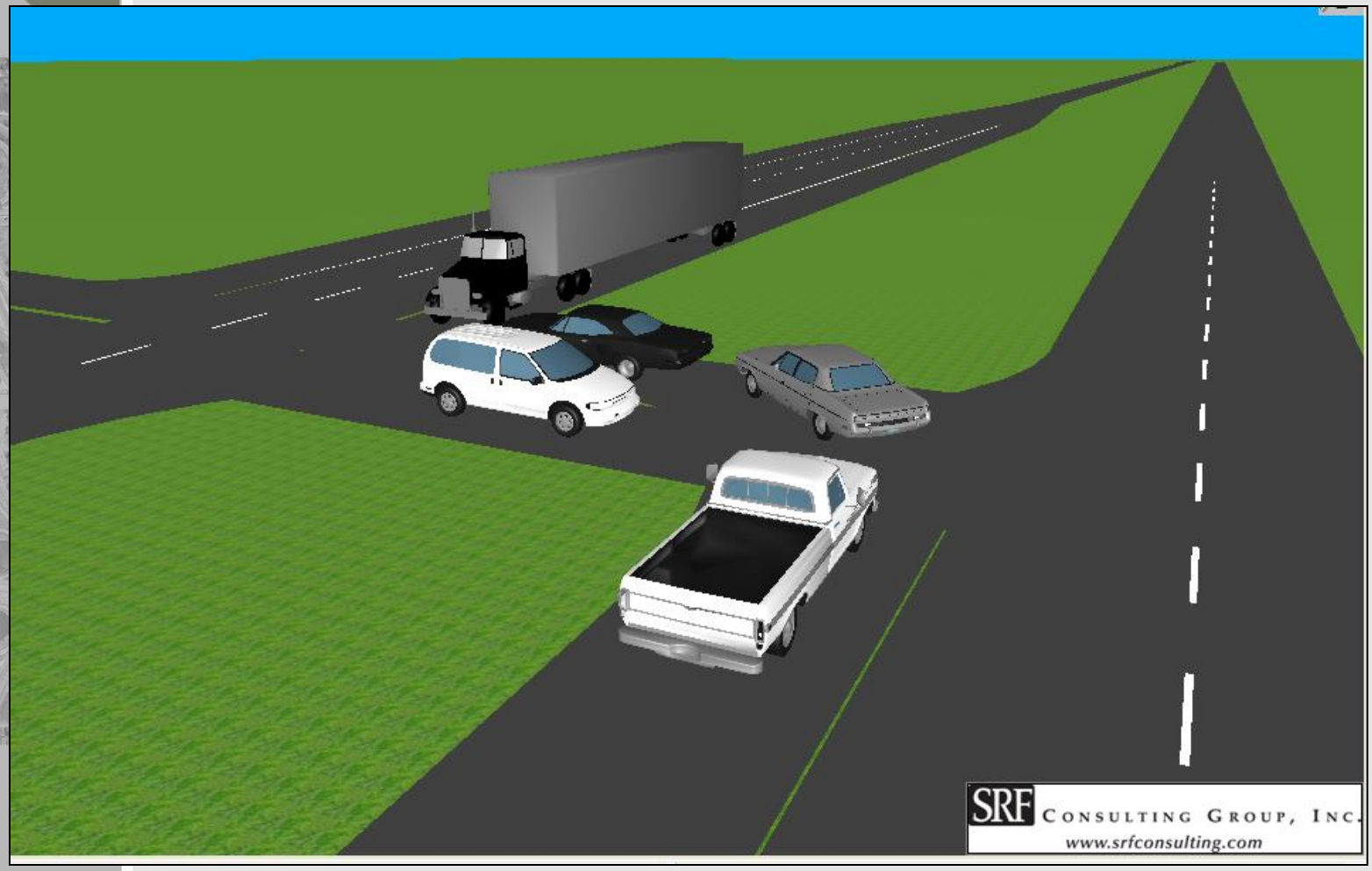
Driver load reduced?



What's wrong with existing designs?

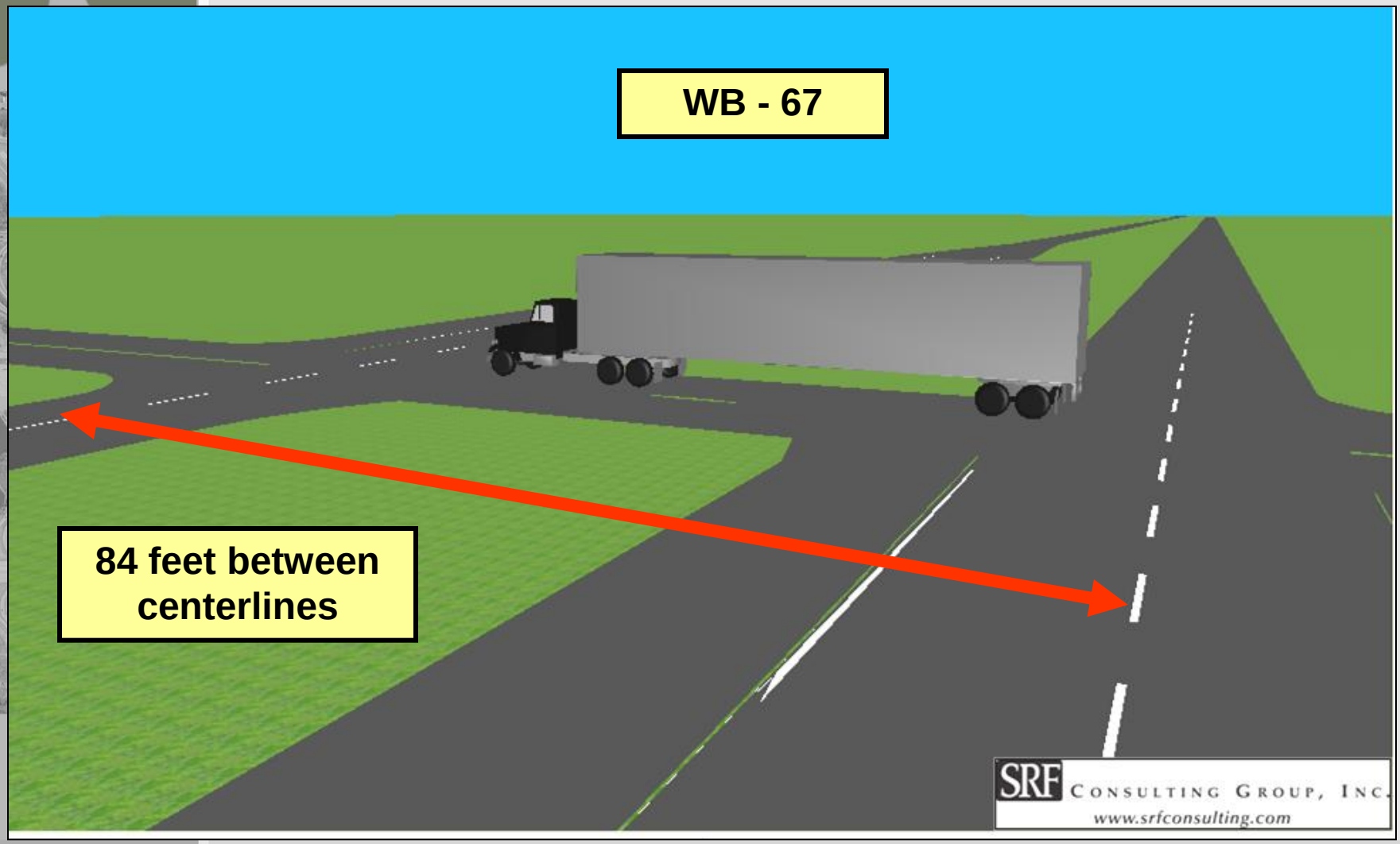
- **Existing designs can make things worse**
- **Trucks cannot be safely accommodated**
- Too many conflict points
- Too many crashes
- Driver overload – difficult decisions

Added conflicts



Trucks

Too long for storage in median



Goals for a safer design

- Alert drivers to intersection
- Reduce and simplify conflict points
  - One to one conflicting flows
  - “Threats” only from right or from ahead (driver sits on left of car)
- Improve driver decision making
- Provide safe storage <u>for any length vehicle</u> and more gaps with two stage crossing

What's a good example?

Roundabouts

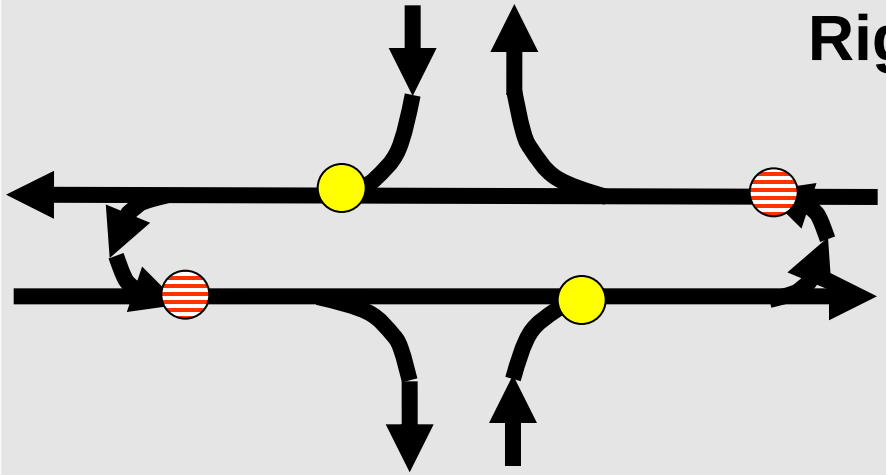
- **Features**
  - Driver forced to notice intersection
  - "Threat" is always from left
  - One to one conflicts
- **Issues**
  - But the roundabout is there 24/7
  - Not efficient for rural expressways with high truck volumes
  - Closely spaced successive roundabouts on high-speed roads are annoying – *example: MoDOT limits roundabouts to one mile minimum spacing*

Roundabout Feature

What are some alternative designs?

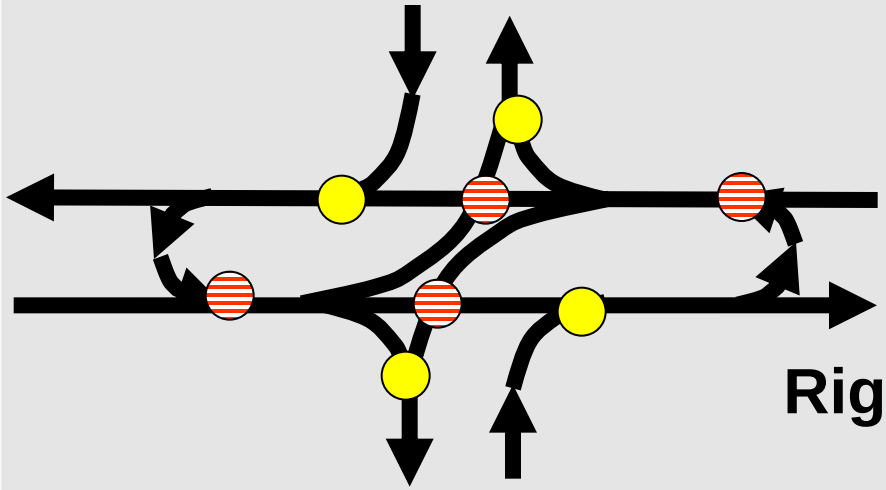
- **Right-in, right-out with U-turns or RCUTs**
- **The RCUT is the focus of today's presentation**
  - **Many studies have been done**
  - **Concept backed by FHWA**
  - **Some examples are in use**

Fewer conflict points



Right-in, right-out

"J-Turn" Intersection



"RCUT" Intersection

Right-in, right-out with lefts off

Design questions

- **Is mainline traffic free flow or pulsed flow?**
  - **Are there platoons from signals?**
  - **Or is mainline flow completely random?**

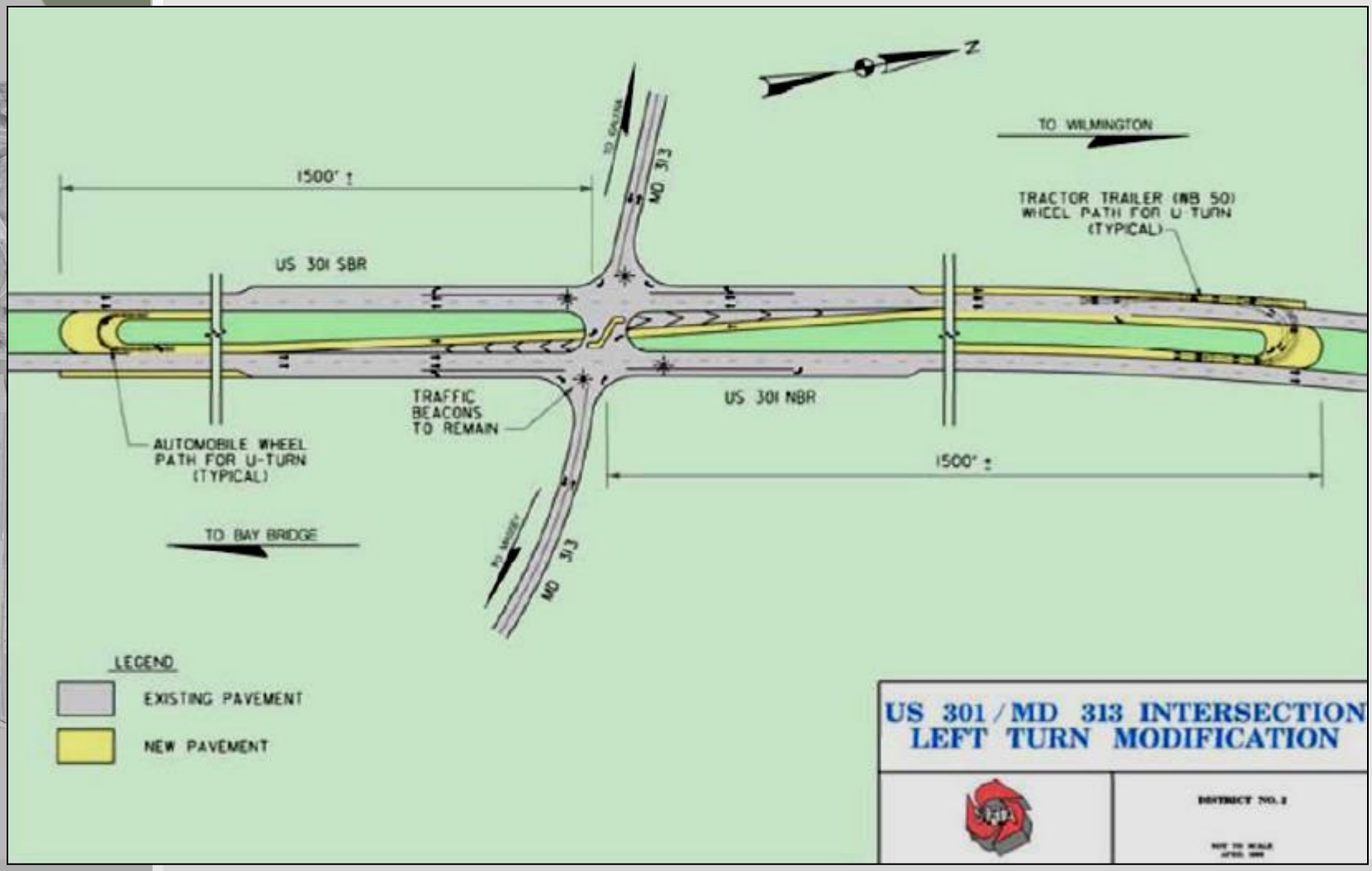
Pulsed flow issues

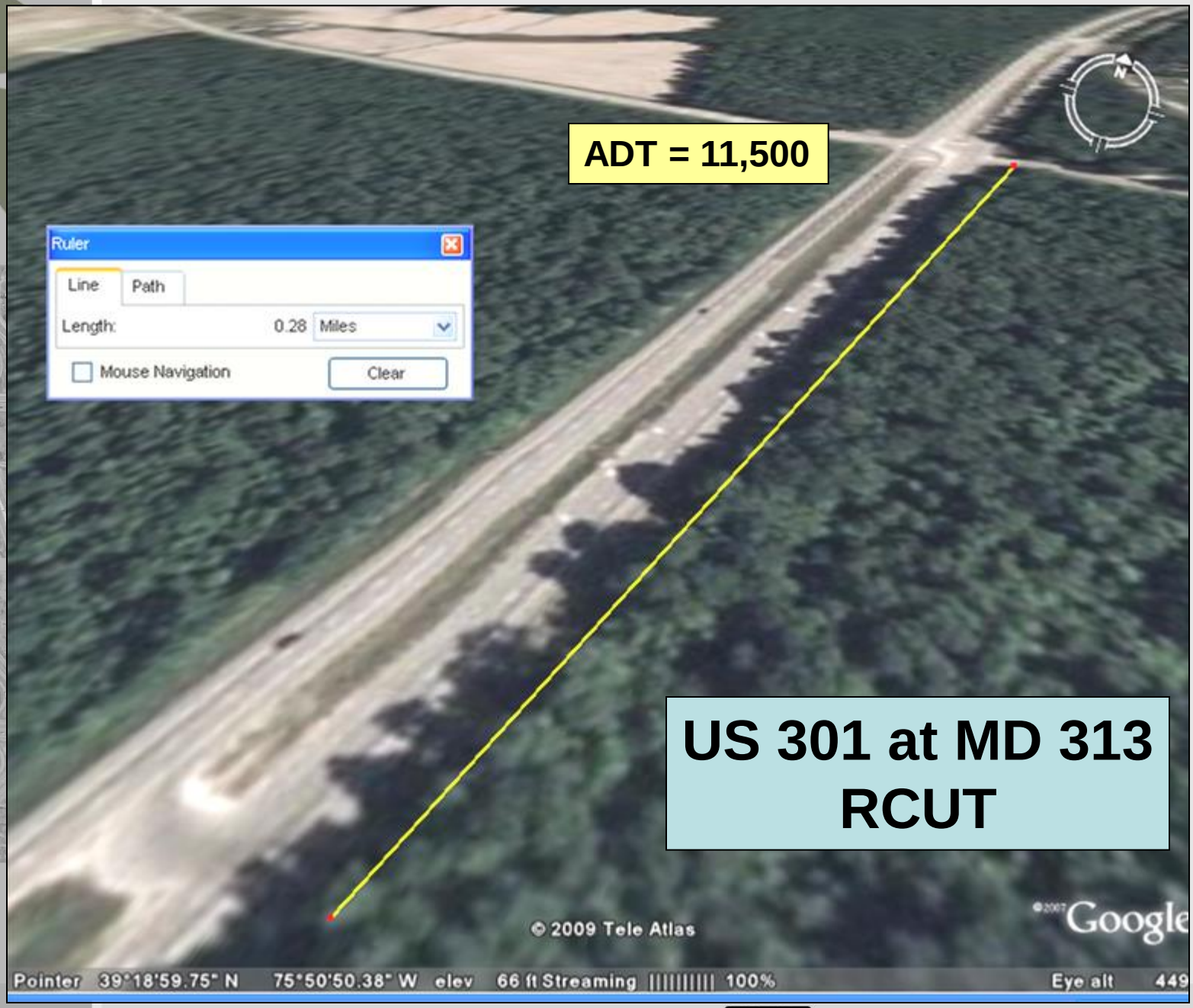
- **Upstream signals generate dense platoons**
- **Entering and weaving across several lanes may be difficult**
  - **Difficult through a platoon**
  - **Easy between platoons**
  - **Partial access intersections perform well near signals**
    - **Entry design should be yield, not merge when signals are around**

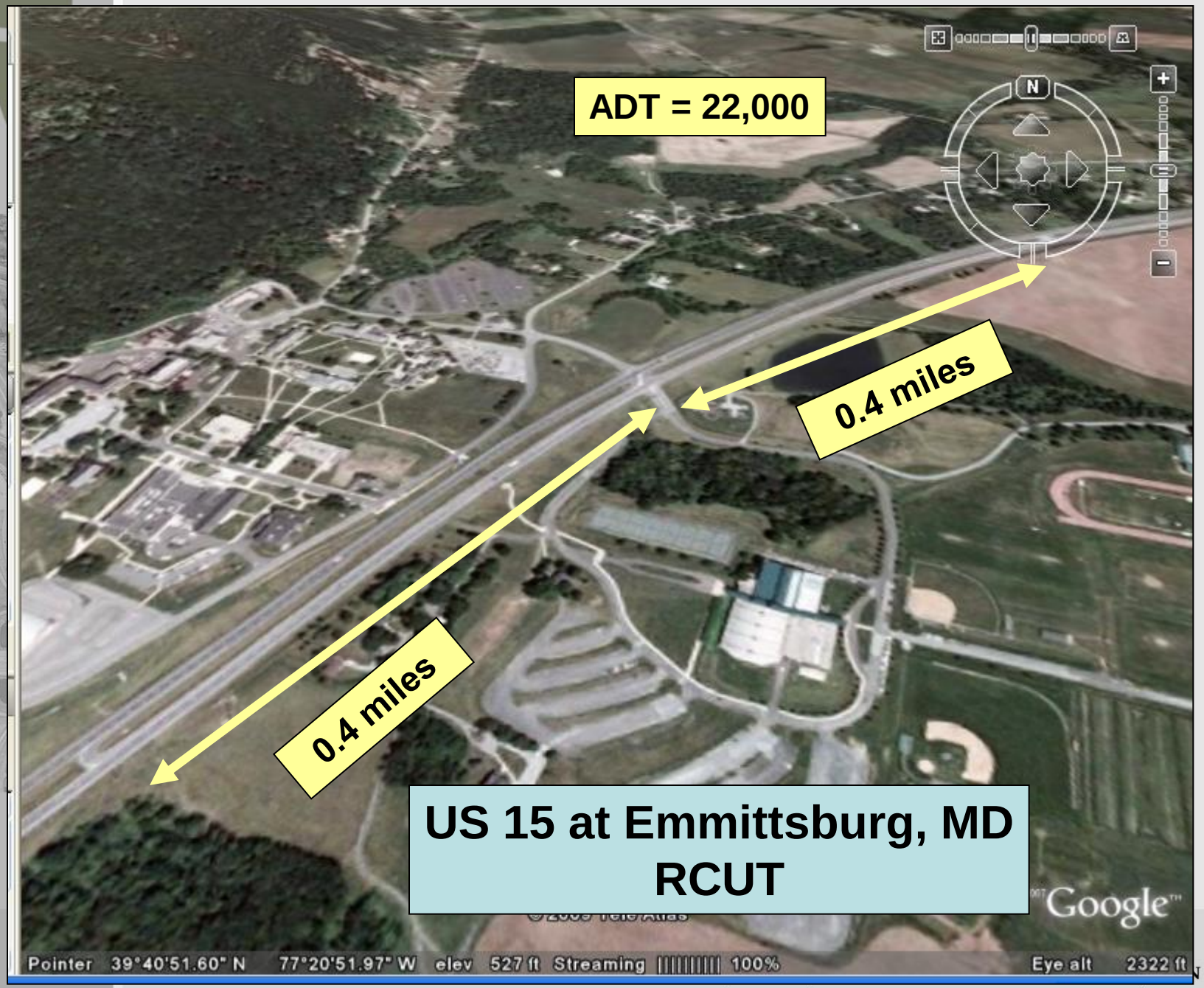
How far to U-turn

- **Weaving through platoons - 10 seconds per lane crossed**
  - **For a 55 mph - 1600 feet to cross two lanes to reach u-turn connection**
  - **Then 180 feet of taper and 300 feet of turn lane**
  - **Total = 2000 feet or more**
- **For lower volumes and "random" flow, 7 seconds per lane change may be adequate = ¼ mile**

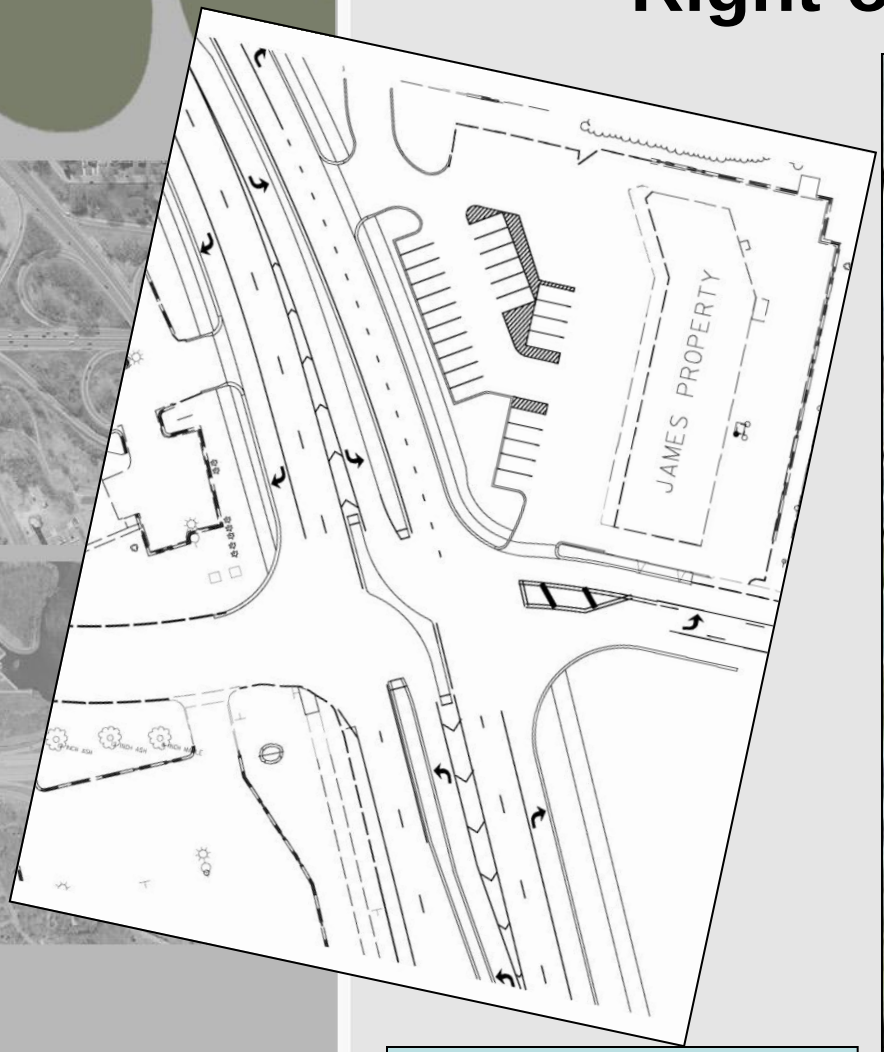
Maryland RCUT Example




ADT = 11,500
Ruler
Line
Path
Length:
0.28
Miles
Mouse Navigation
Clear
US 301 at MD 313
RCUT
© 2009 Tele Atlas
Google
Pointer 39°18'59.75" N 75°50'50.38" W elev 66 ft Streaming 100%
Eye alt 449


ADT = 22,000
0.4 miles
0.4 miles
US 15 at Emmittsburg, MD
RCUT
Google
Pointer 39°40'51.60" N 77°20'51.97" W elev 527 ft Streaming 100%
Eye alt 2322 ft

Close-up
Right-off, right-on, left off



Co Rd 50 at 175th
Lakeville, MN

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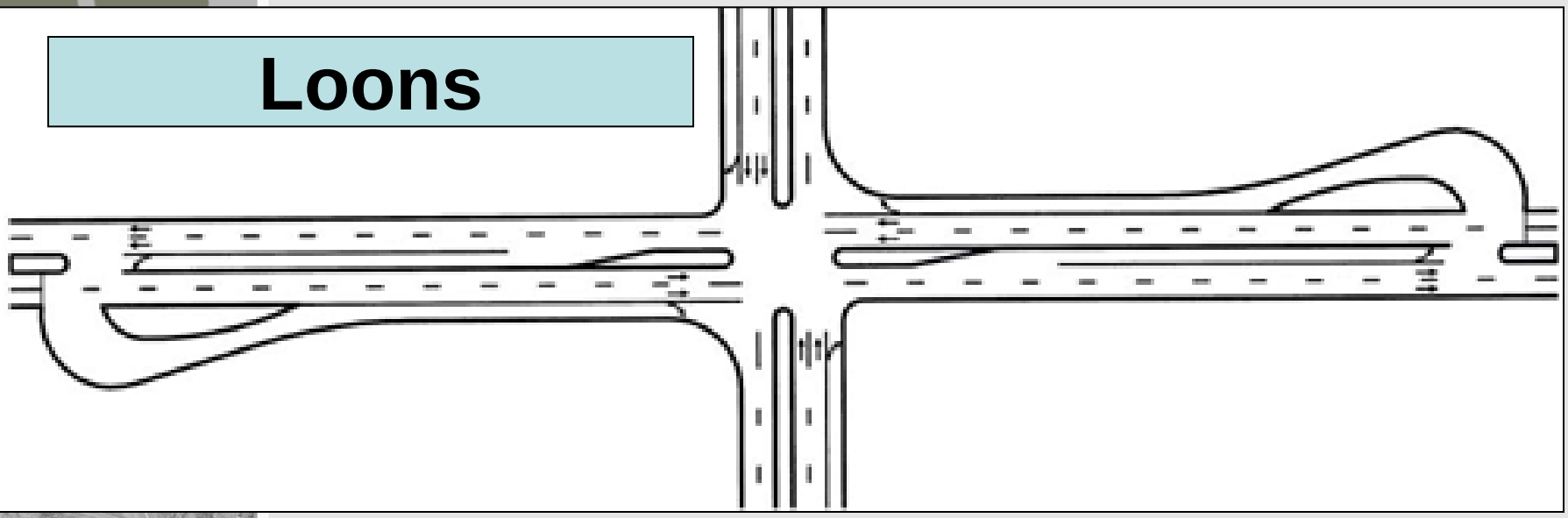
Design Questions

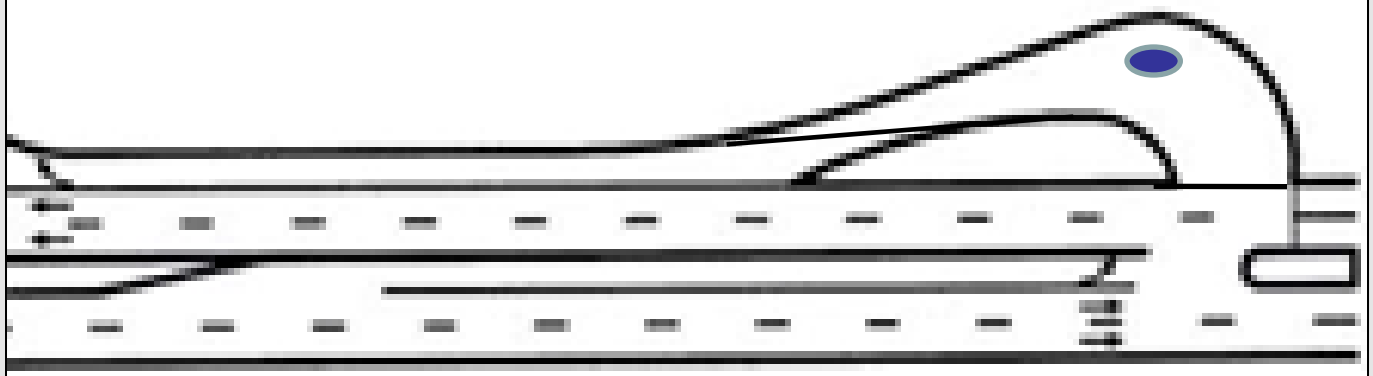
- **How should U-turns be handled?**
  - **Do we put u-turns into left oncoming lane and use inside acceleration lanes?**
  - **Or do we use “loons”?**
- **Is mainline traffic free flow or pulsed flow?**
- **How far to the u-turn connection?**

Loons

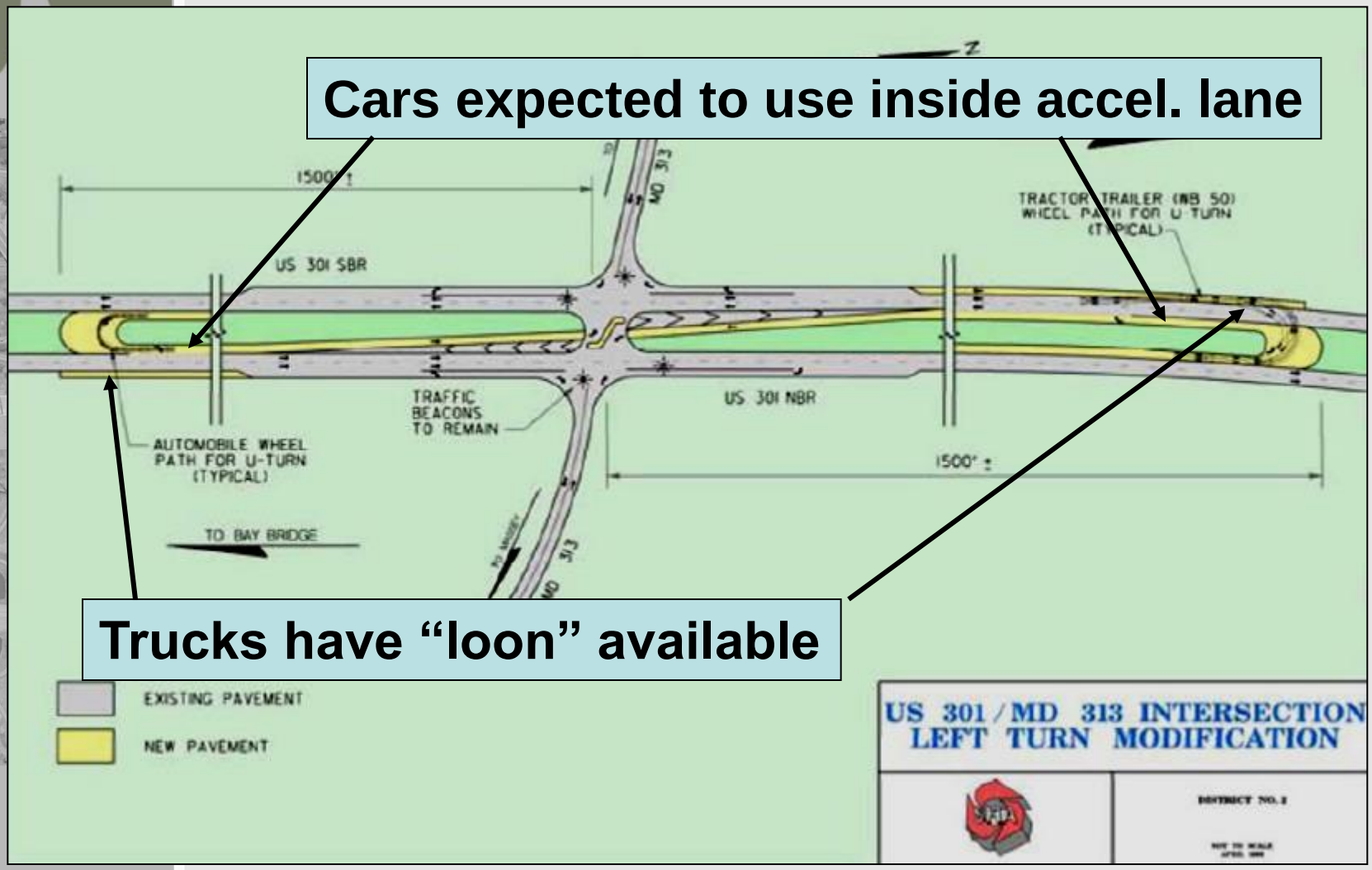


- Medians too narrow for truck U-turns
- U-turns directed to outside
  - Both lanes crossed
  - But smaller gap needed
  - Acceleration is in the right lane
  - Fewer impacts on through traffic
  - Next destination may be to right anyway

Why are they called “Loons”?



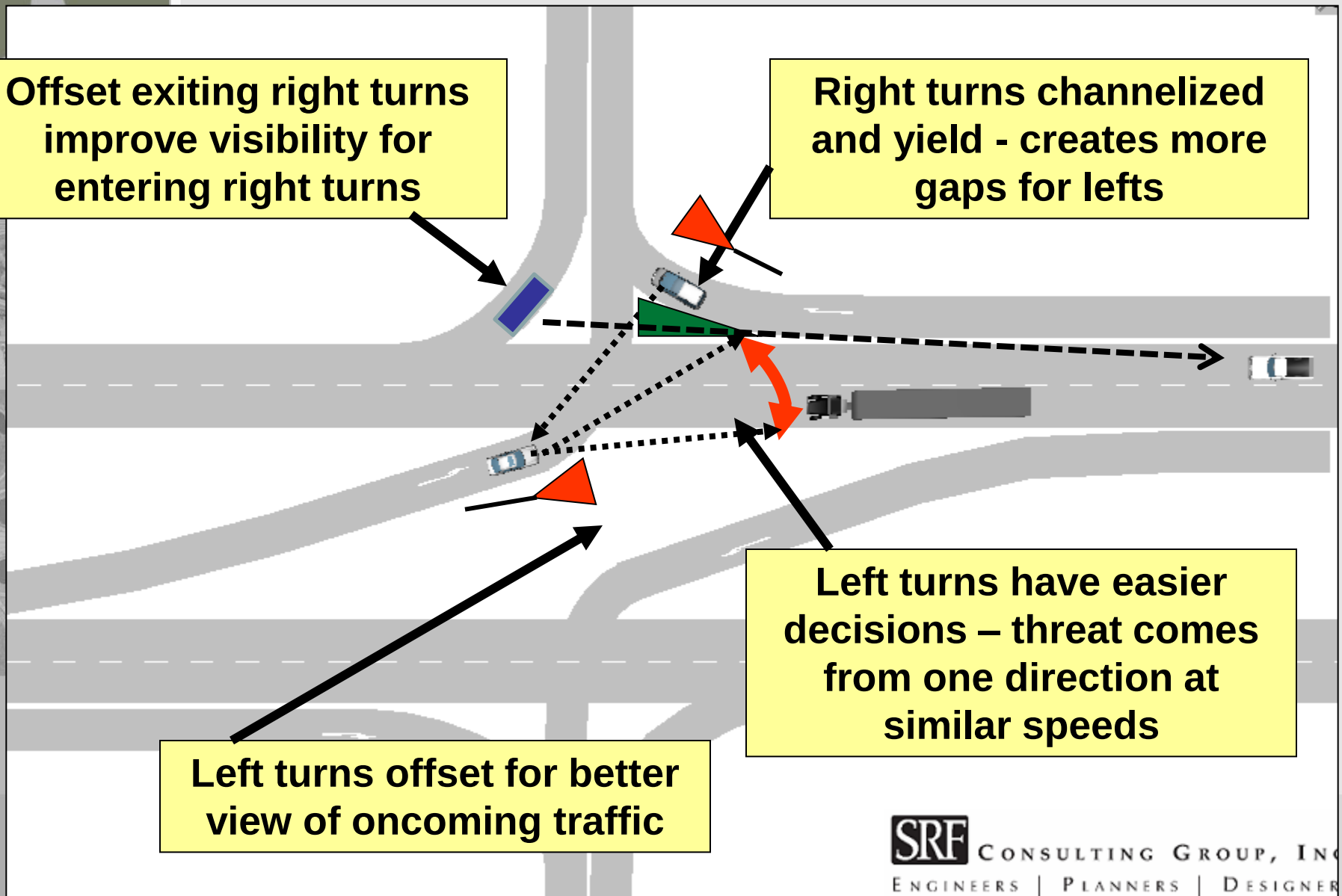
Maryland RCUTs Use Both



Design Questions

- **How are opposing right turns handled to benefit lefts?**
- **Is mainline traffic free flow or pulsed flow?**
- **How far to the u-turn connection?**
- **How should U-turns be handled?**

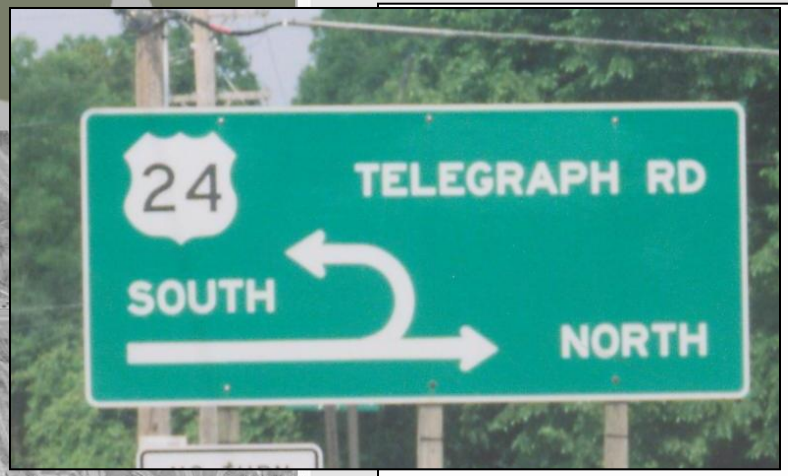
Opposing right turn treatment

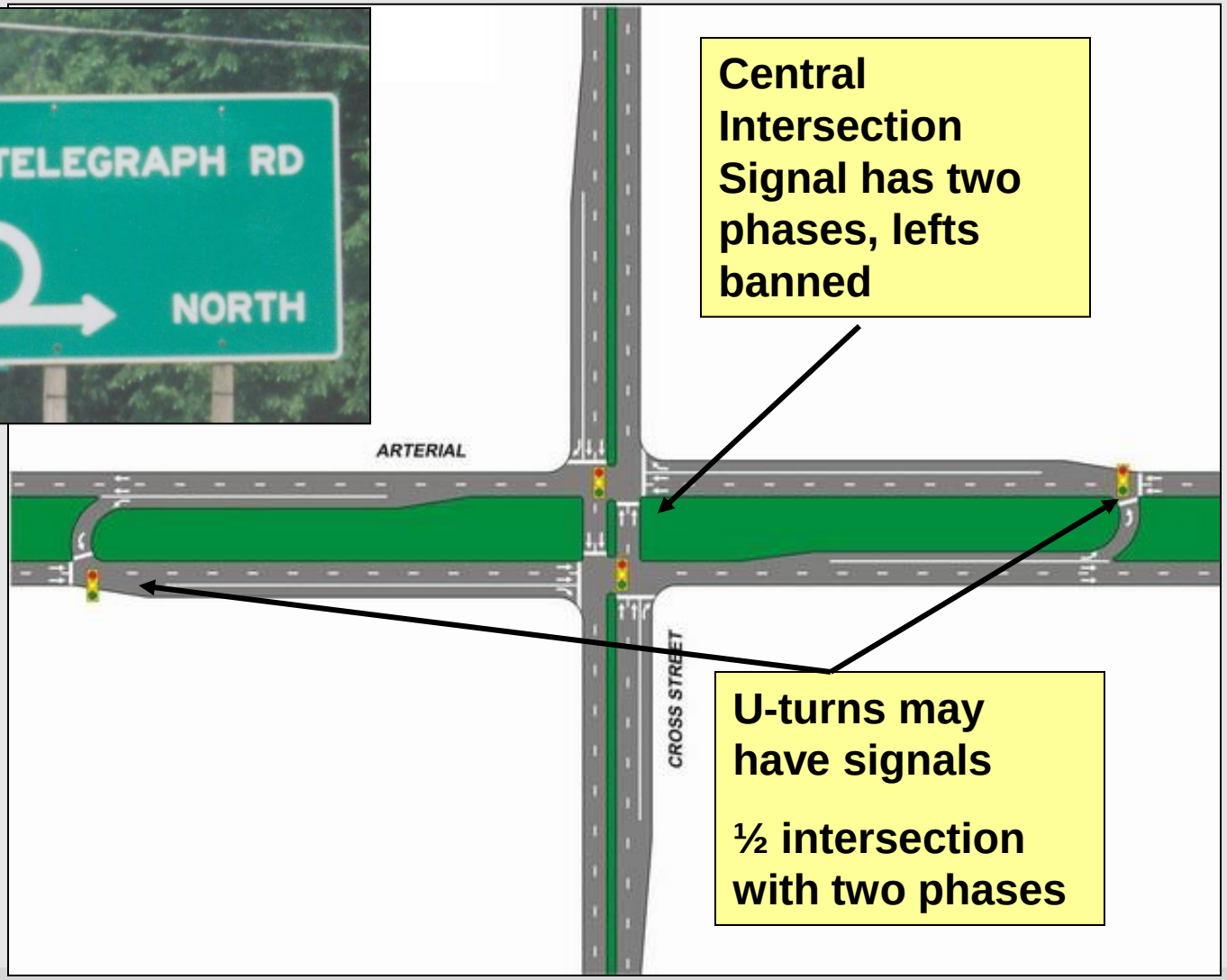


Other Innovative Designs

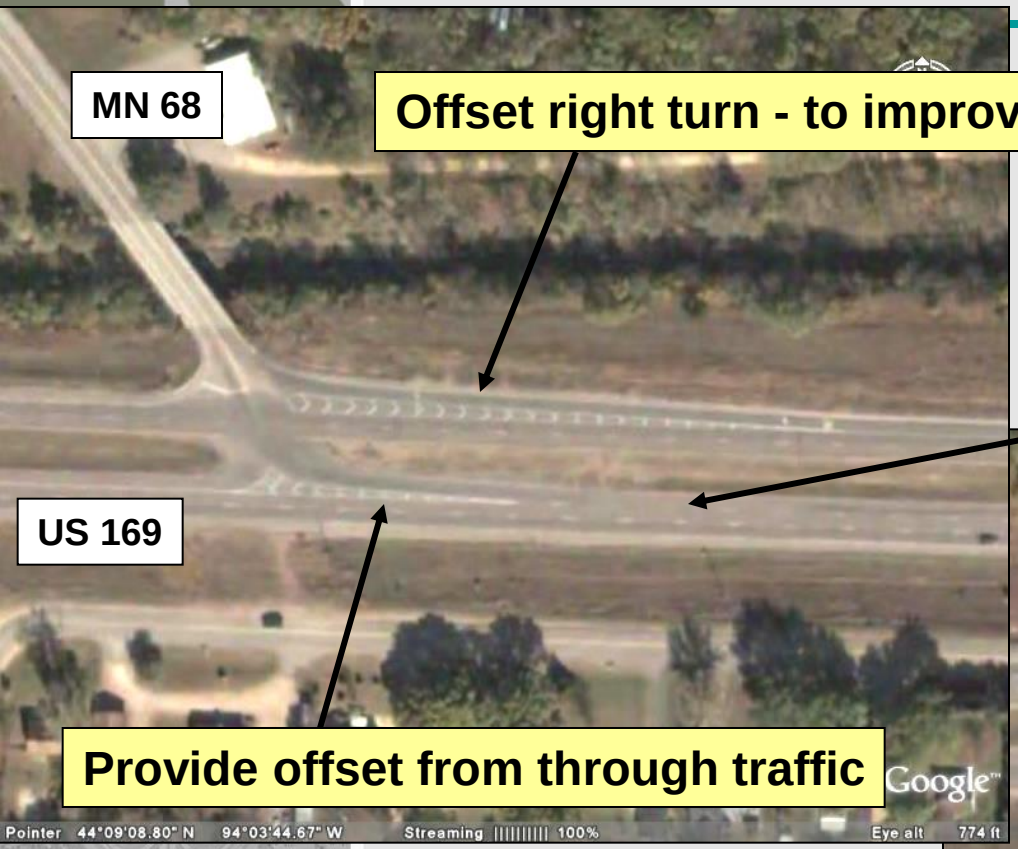
- Michigan U-turns
- Offset “Ts” with inside merges
- Compound Roundabouts
- Continuous Flow Intersection (CFI)
- Through-abouts
- Reduced Conflict (RCI)
  - RCUTS
  - J-turns

Michigan “U” Turns



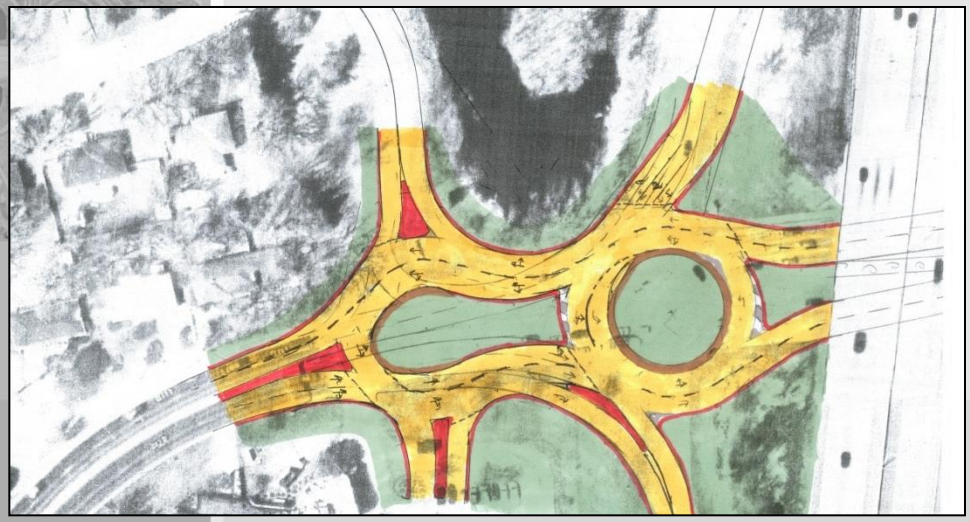


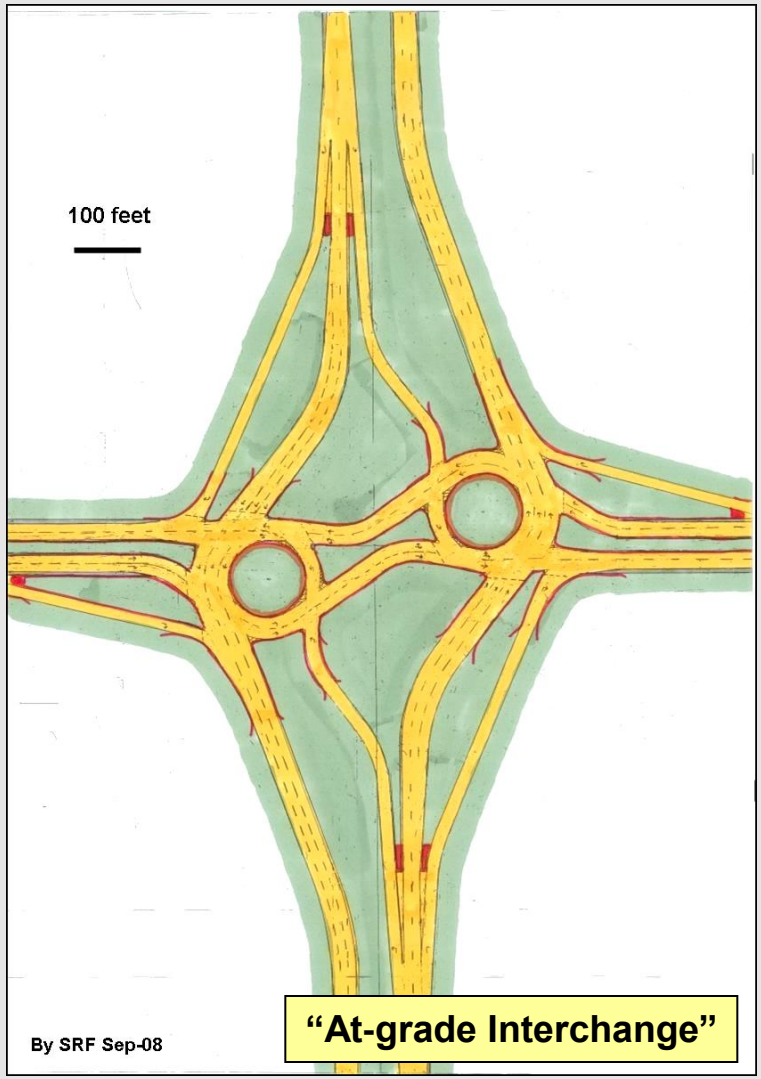
Offset “Ts” With Inside merges



Compound Roundabouts

In U.K. - Image has been reversed





"At-grade Interchange"

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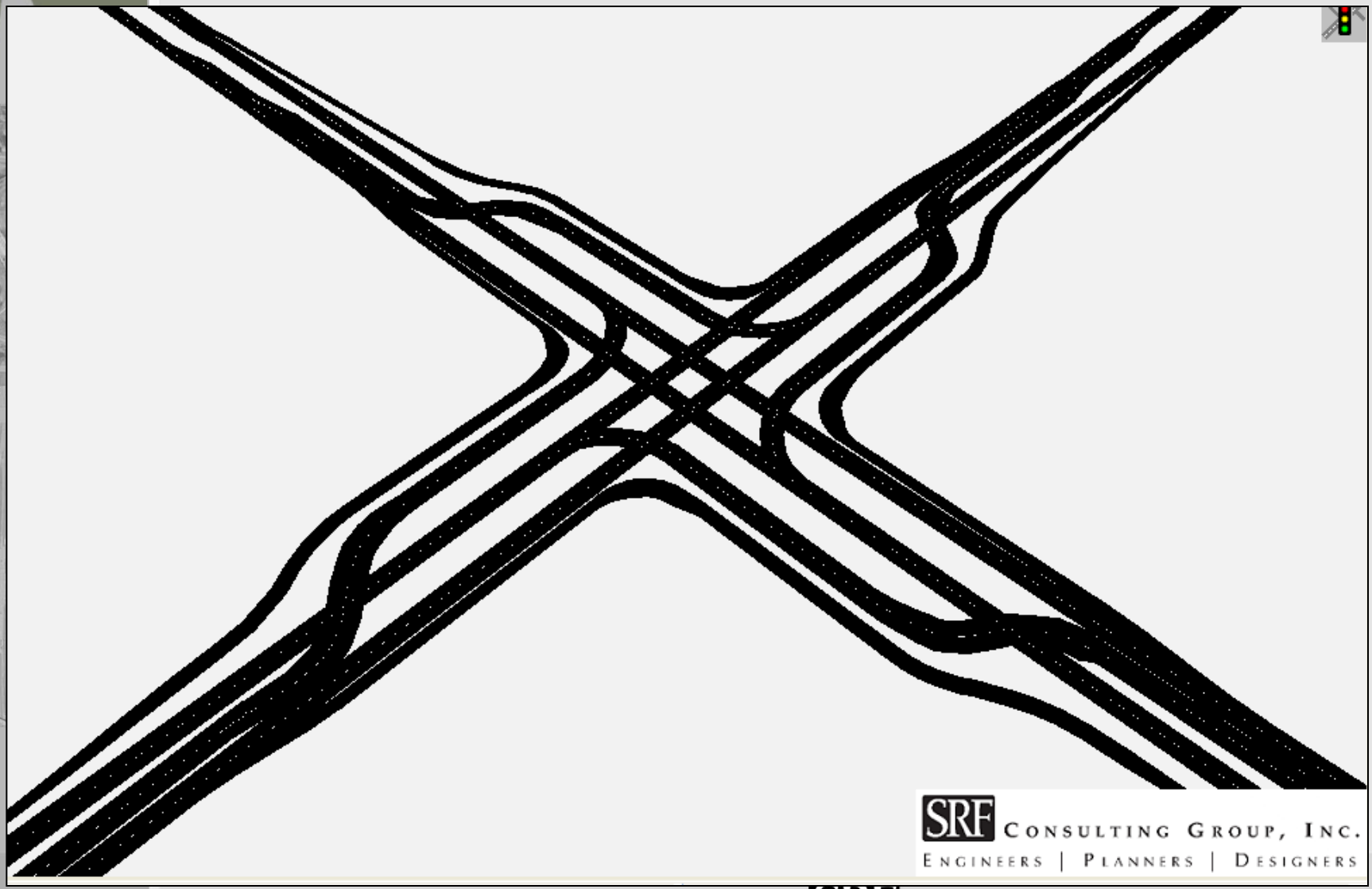
Continuous Flow (CFI)

(or “Lefts in advance”)



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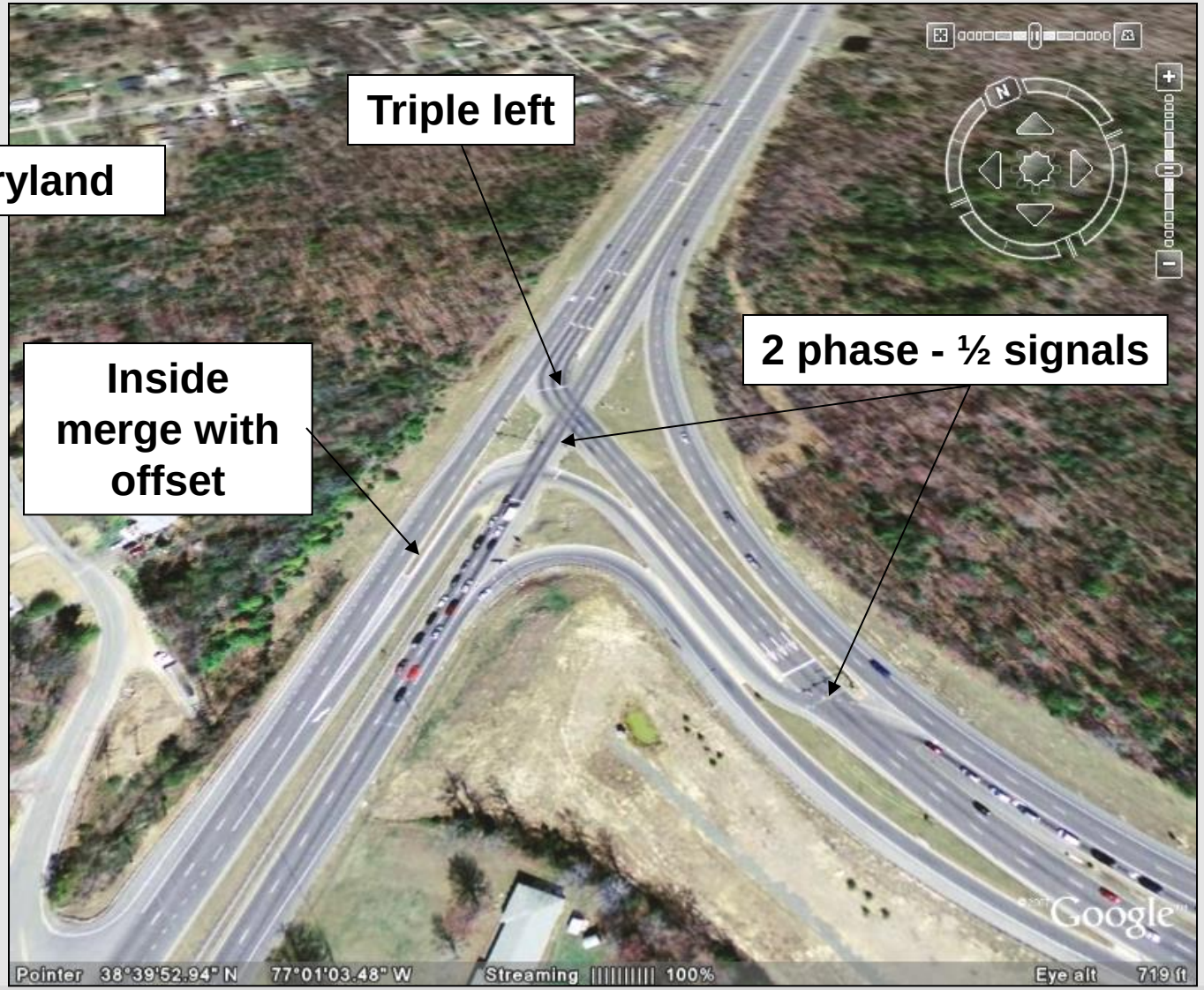
CFI "T"

Located in Maryland



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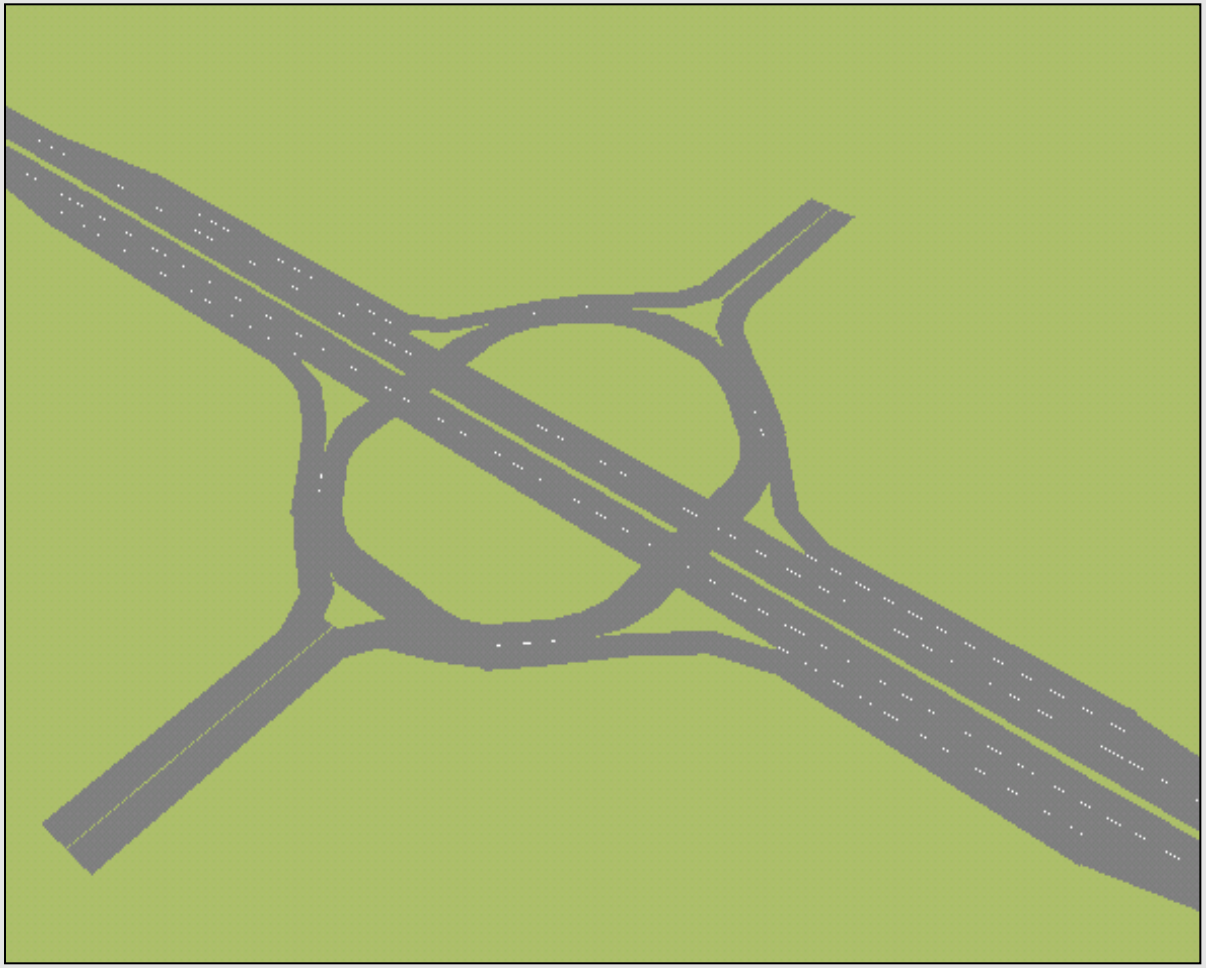
Throughabout

- Favors mainline through traffic
- Others drive it as a roundabout
- Signals or STOP signs control the two crossings
- Popular in Spain and some in France
- One in Washington D.C. (with signals)



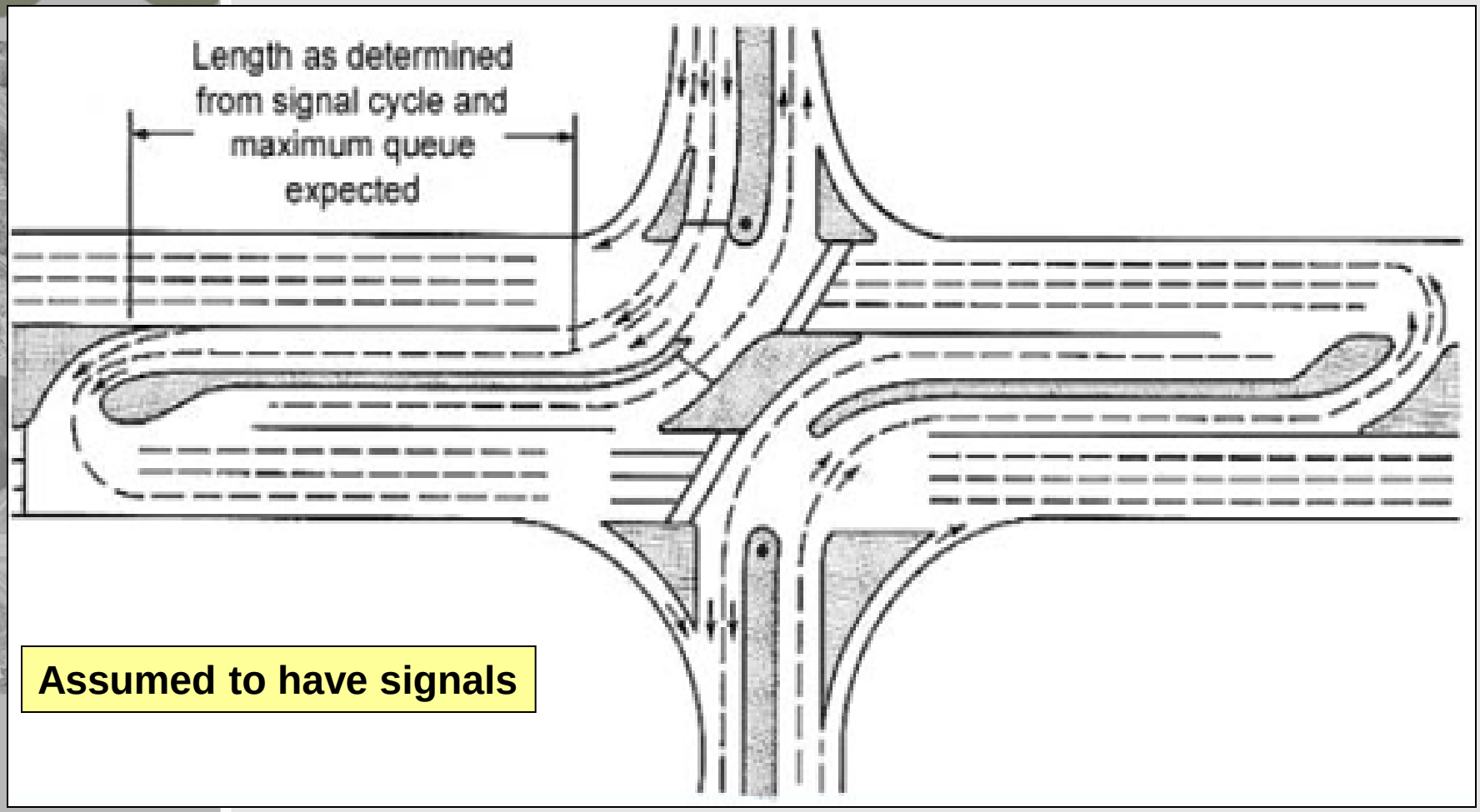
Throughabout

Located in Washington D.C.

Can an efficient, safer intersection be created?

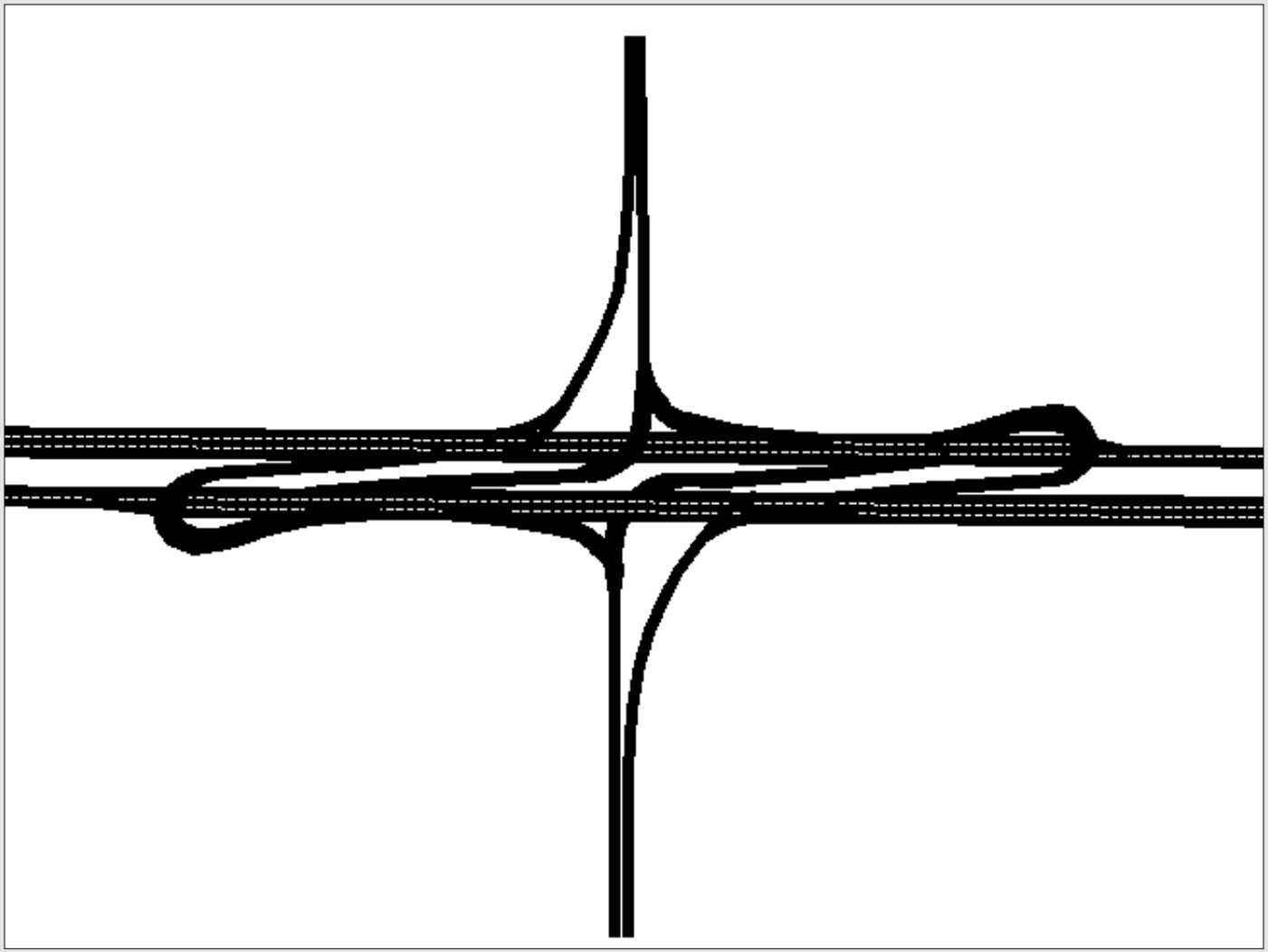
- The reduced conflict intersection – RCI
- Enhanced version of the “J” turn
- Features
  - Problem addressed at single location
  - Two stage crossing, long vehicle storage
  - Fewer, simpler conflicts
  - Loons for large vehicles turns onto mainline
  - No inside merges
  - No weaving
    - Entering traffic crosses directly to median on gaps across two lanes

FHWA – RCI
(Super Street Intersection)



Assumed to have signals

RCUT



Recommendations and Observations

- **Separate and simplify conflict points**
  - **Try for only two conflicting flows**
- **Drivers look only to left or ahead**
- **Avoid drivers yielding to the right *(BTW, the rule of the right is wrong)***
- **Keep sight lines clear – offset mainline turns if possible**
- **Consider flows (pulsed or free)**
- **Watch weaving distances – provide 10 seconds per lane change**

Recommendations and Observations-continued

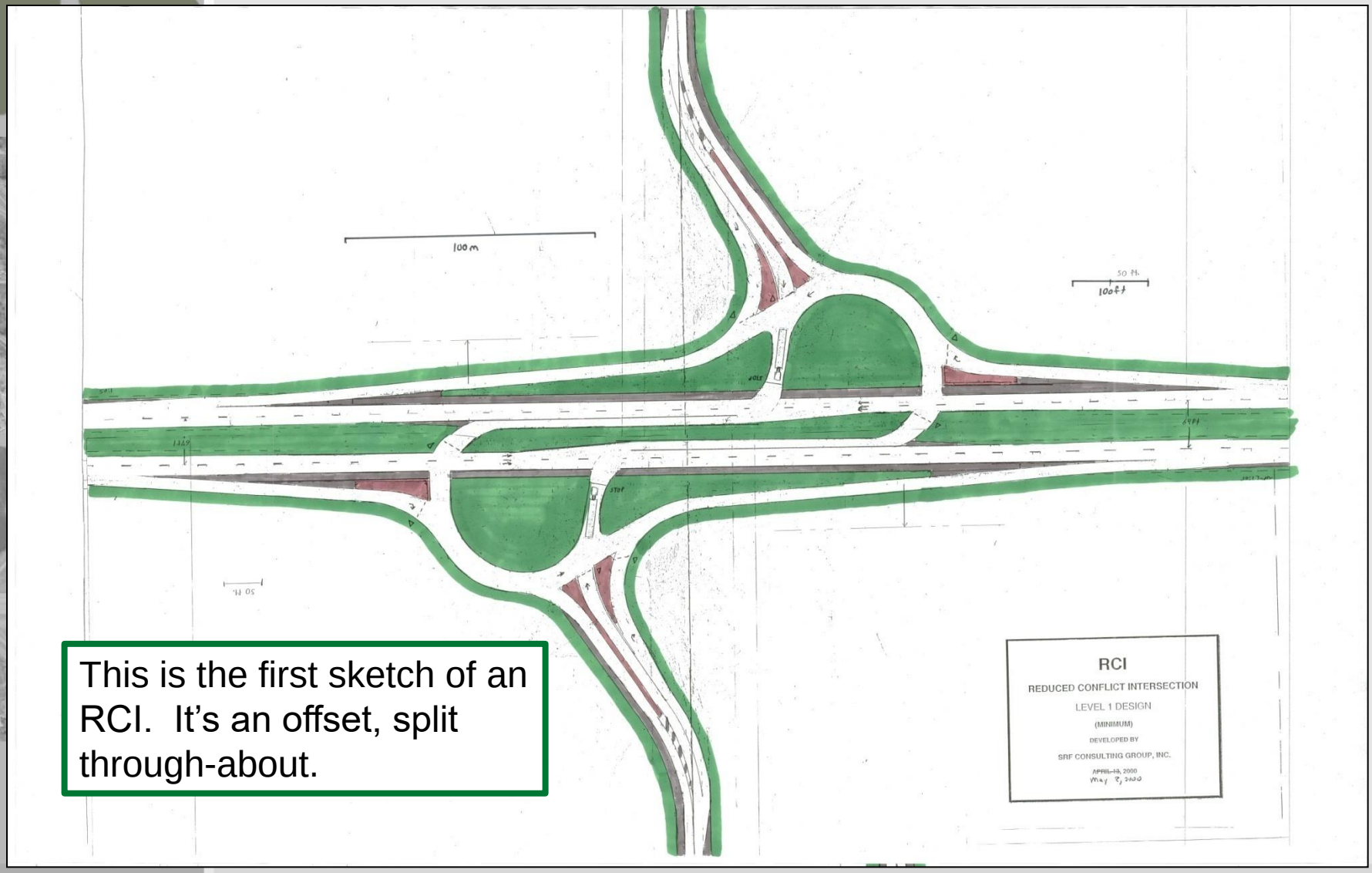
- Crash rates for side street left turns and side street through movements reduced by 20 to 60 percent when converted to “J” turns
- Use “loons” rather than inside merges

International Efforts at Reduced Conflict Intersections

Great Britain – Compact Offset "T's"
(photo is reversed)

International Efforts at Reduced Conflict Intersections

RCI (1999)



This is the first sketch of an RCI. It's an offset, split through-about.

Resources

- **Dennis Eyler – SRF Consulting Group**
  - deyler@srfconsulting.com
- **Joe Bared – FHWA**
  - Synthesis of the Median U-Turn Intersection Treatment, Safety, and Operational Benefits
  - Joe.Bared@fhwa.dot.gov
  - http://www.tfhrc.gov/safety/inter.htm
- **Tom Maze**
  - tmaze@iastate.edu
- http://www.ctre.iastate.edu/educweb/expressway_intersections /
- **Joseph E. Hummer, PhD, PE -** Associate Professor
- Department of Civil Engineering - North Carolina State University
- Email hummer@eos.ncsu.edu
- **Josh Hochstein**
  - jlhoax@iastate.edu
- **Howard Preston** – CH2MHill
  - Howard.Preston@ch2m.com
- **Ingrid B. Potts Midwest Traffic Institute**
  - ipotts@mriresearch.org

Concept Drawings of Reduced Conflict Intersection (RCI) Designs for Use on a Super-2 Roadway

Dennis Eyler – October 2023

1. **A typical design for a rural intersection with two higher volume, two-lane roadways**
2. **It does not meet the design goals for the Super-2 concept.**

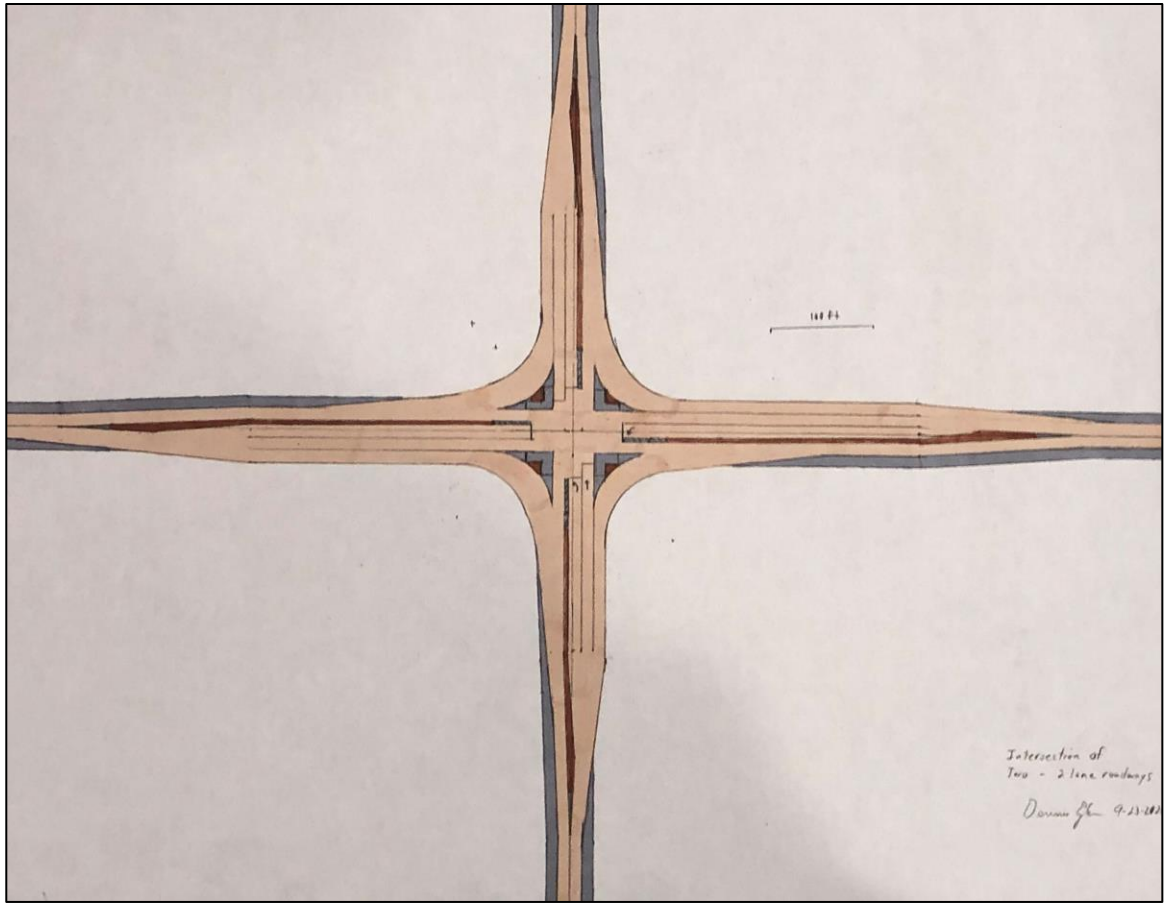
Features:

1. With STOP signs on the minor roadway, it doesn't disrupt the major highway traffic
2. You turn left to go left and you turn right to go right
3. Deceleration lanes for exiting traffic
4. Acceleration lanes for right turns onto the major roadway
5. No "locking up" of opposing left turns if median islands are correctly designed

Issues:

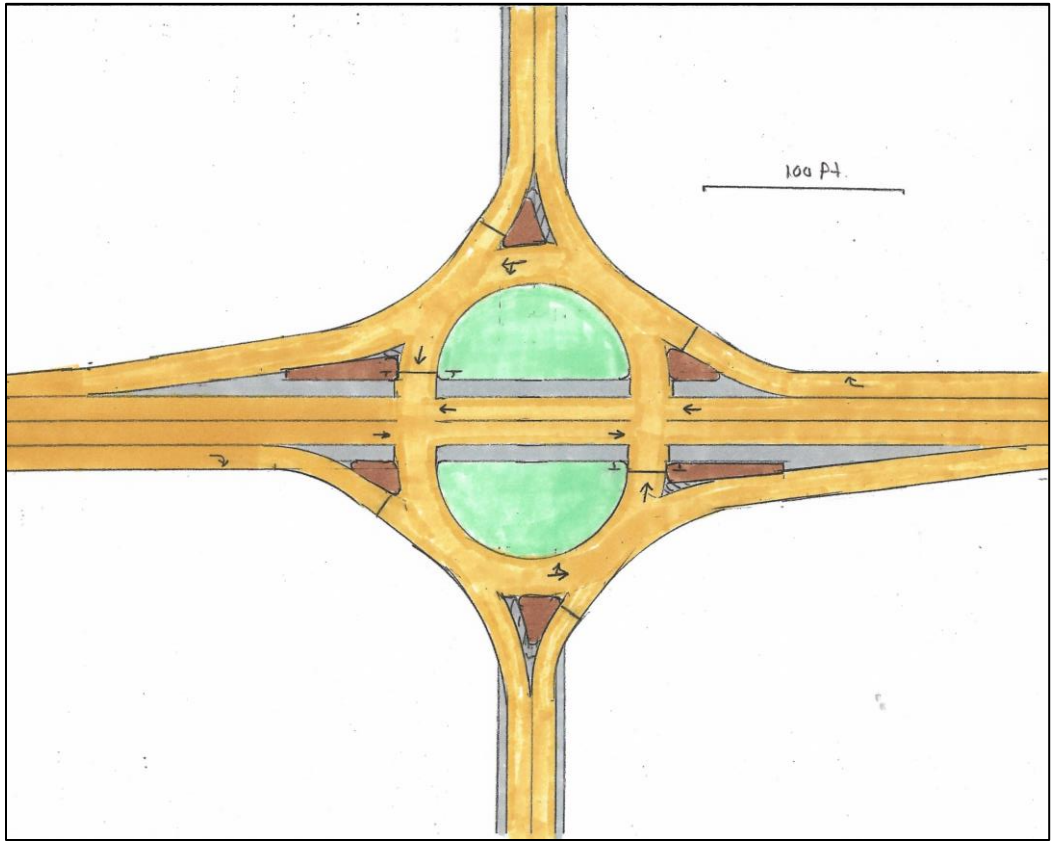
1. Many conflict points
2. Several conflict points involve traffic approaching from 4 directions
3. A traffic threat comes from the driver's right
4. A two-stage crossing is not provided
5. Signals or all-way stops would be needed at lower volumes

Standard 3-in, 1 out Intersection



Through-about

1. **This concept is popular for use at rural intersections in Spain and France.**
2. **It does not meet the design goals for the Super-2 concept.**



Features:

1. Does not “disrupt” the major highway traffic
2. Fewer conflict points than a standard intersection
3. Simpler conflict points
4. Deceleration lanes for exiting traffic
5. Acceleration lanes for all entering traffic which then also merges from the right
6. Less chance for STOP signs to be “blown”
7. No “locking up” of opposing left turns
8. Reduces the need for signals or all-way stops

Issues:

1. Minor roadway left turns and through movements have to watch two directions when selecting a gap to cross the major roadway
2. A traffic threat comes from the driver’s right
3. A two-stage crossing is not provided
4. Left turns from a heavy major roadway traffic flow must exit to the right then cross back through that flow
5. Unfamiliar to U.S. drivers and the intent of the geometry could be violated by illegal turns

Reduced Conflict Intersection 1999

1. **An early attempt to fix the problems of the through-about**
2. **It meets the design goals for the Super-2 concept.**

Features:

1. Does not “disrupt” the major highway traffic
2. Fewer conflict points than a standard intersection
3. Simpler conflict points and all threats are 1:1 and come from ahead or from the left
4. Deceleration lanes for exiting traffic
5. Acceleration lanes for all entering traffic which then also merges from the right
6. Less chance for STOP signs to be “blown”
7. No “locking up” of opposing left turns
8. Two stage crossings provided for any length vehicles
9. Reduces the need for signals or all-way stops
10. Lefts from the major roadway are to the left and do not need to pass through the heavy traffic they just left
11. Left turns from the major roadway have priority over exiting right turns

Issues:

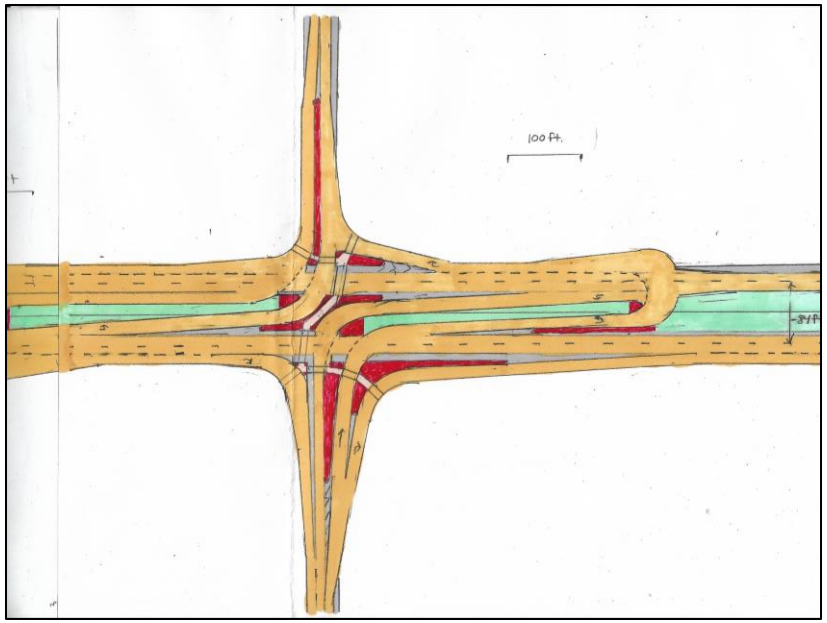
1. Space required
2. Costs

1. **It meets the design goals for the Super-2 concept.**

The Restricted Crossover – U-turn

Features:

1. Does not “disrupt” the major highway traffic
2. Fewer conflict points than a standard intersection
3. Simpler conflict points all threats are 1:1 and from ahead or from the left
4. Deceleration lanes for exiting traffic
5. Acceleration lanes for all traffic which also merges from the right
6. Less chance for STOP signs to be “blown”
7. No “locking up” of opposing left turns
8. Two stage crossings provided for any length vehicles
9. Reduces the need for signals or all-way stops
10. Lefts from the major roadway are to the left and do not need to pass through the heavy traffic they just left
11. Left turns from the major roadway have priority over exiting right turns
12. If signals are needed, they can be added to only the node where they are required



Issues:

1. Whether or not entry from the minor roadway should cross directly into the U-turn lane or whether the downstream U-turns should be reached by turning right, accelerating, merging, changing lanes while weaving through high-speed traffic and then decelerating in the U-turn lane. That design decision is also affected by the nature of the major roadway flow. Is it random flow at an isolated location, or is the intersection near signals which produce pulsed or platoon flow?

1. **It meets the design goals for the Super-2 concept.**

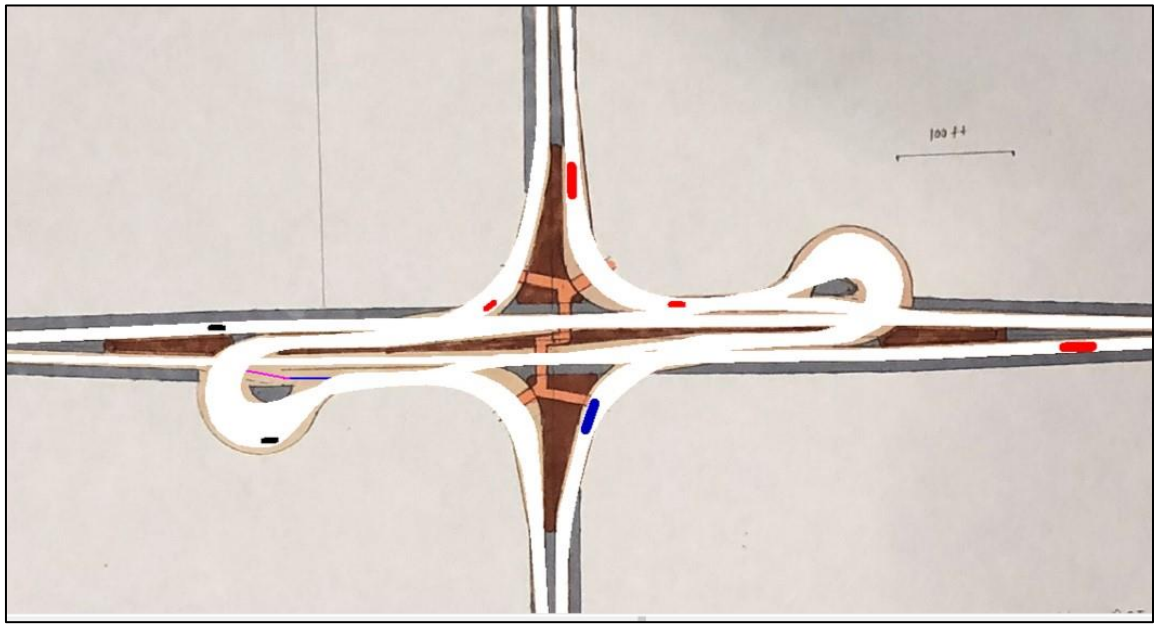
Features:

1. Minimal left turn lane lengths which assume some deceleration while still in through traffic

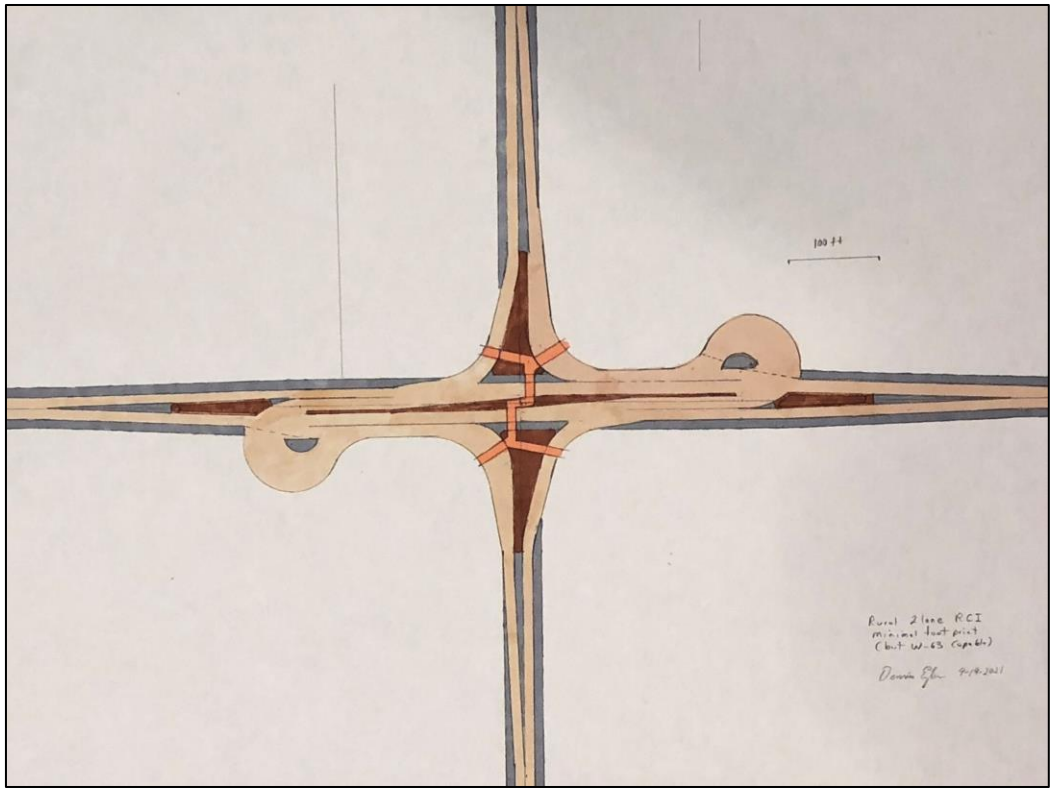
Issues:

1. Turn lane lengths
2. The size of the loons is determined by the design vehicle

WB-63 Truck tracking on the ultra compact RCUT



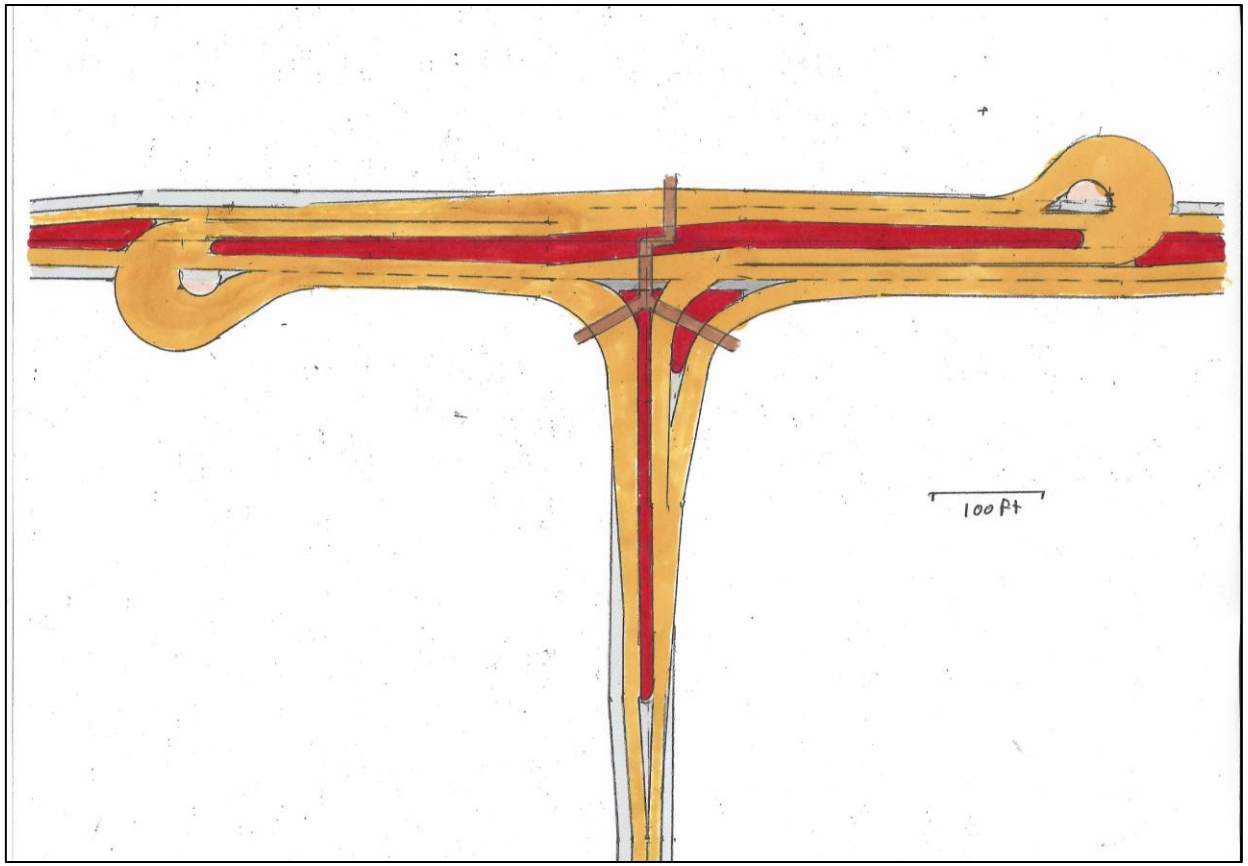
Ultra Compact Restricted Crossover – U-turn for a Two Lane Road



Restricted Crossover – U-turn for a “T” Intersection on a Two Lane Road

Example of a U-turn loon from New Zealand

Image has been reversed



Comparison of travel times for various intersection designs
Peak Hour

Peak Hour Travel Times	J-turn	RCUT	Intersection With Signal	Roundabout
Total Travel Time (hours)	27.8	27.1	27.1	27.3
Average Travel Time For All Vehicles	82.2	79.9	80.3	80.7
Average Travel Time For Mainline Through Vehicles	70.1	70.3	77.4	81.1
Travel Time For Left Turns From M.L.	121.3	84.0	91.2	80.1
Travel Time For Minor Street Through	144.1	142.1	98.7	81.9

Disclaimer: the author designed (including detector layouts and their functions) and timed the signals used for this comparison done in VISSIM with their RBC controller. Someone using software such as Synchro, may not get the same results.

Comparison of travel times for various intersection designs
8th Highest Hour

8th Highest Hour Travel Times	J-turn	RCUT	Intersection With Signal	Roundabout
Total Travel Time (hours)	15.0	14.6	14.5	14.4
Average Travel Time For All Vehicles	79.9	77.8	76.9	79.0
Average Travel Time For Mainline Through Vehicles	68.5	68.4	73.8	78.5
Travel Time For Left Turns From M.L.	119.4	85.1	83.4	81.0
Travel Time For Minor Street Through	135.1	134.7	93.9	79.8

MnDOT “T” intersection with left side acceleration lane

Comment Log Submission No. 79

From: Kim Falinski <kim.falinski@TNC.ORG>
Sent: Monday, February 24, 2025 4:06 PM
To: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>
Cc: Tamara Farnsworth <t.farnsworth@TNC.ORG>; Emily J. Fielding <efielding@TNC.ORG>
Subject: [EXTERNAL] Honoapi'ilani Draft EIS Comments

Hello Ken,

Please accept the following draft EIS comments from The Nature Conservancy, Hawai'i and Palmyra chapter.

Thank you, and please let us know if there are any questions we might be able to answer,

Kim

1

Kim Falinski
Coastal and Estuarine Scientist
kim.falinski@tnc.org
(808) 206-6565

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February 24, 2025

Hawaii Department of Transportation, Highways Division
Attention: Ken Tatsuguchi, Head Planning Engineer
869 Punchbowl Street, Room 301 Honolulu, HI 96813
Email: ken.tatsuguchi@hawaii.gov
Re: Comments on the Honoapi'ilani Highway Improvements Draft Environmental Impact Statement

Dear Mr. Tatsuguchi,

Thank you for this opportunity to provide comments on the Honoapi'ilani Highway Improvements Project (HHIP) Draft Environmental Impact Statement and the proposed preferred alternative, dated January 2025.

The Honoapi'ilani Highway from Ukumehame to Launiupoko in West Maui ranks as one of the most threatened highways in the state of Hawai'i because of rising sea levels, king tides, storm surges and other coastal hazards fueled by climate change. The Hawai'i Department of Transportation has prioritized this important road connecting central Maui to the growing West Maui community because of its risk from coastal erosion.

What we are working on

Our team at The Nature Conservancy (TNC) has been working on a ridge to reef approach to protecting and restoring the sensitive environments adjacent to the 939-acre Olowalu reef tract that involve working with community and government partners to establish a vision for a restored coastal area and watershed. We have been excited about the opportunity presented by the highway realignment to collaborate to protect key ecosystem functions. Our comments emphasize the need to protect the unique coral reef and future wetland extent, preserve Pāpalaua sediment retention basin and its sediment capture capacity, design ecologically sensitive stream crossings, and recommend a drainage plan that uses green infrastructure to filter and infiltrate stormwater.

With regards to the Honoapi'ilani Highway Improvement Project (HHIP), TNC is focused on three areas: 1) Reducing sedimentation to the coral reef; 2) Implementing a suite of mauka-makai protective and restorative interventions that protect the reef, wetlands and streams, and 3) Visioning, with Hawai`i Department of Transportation, Highways Division (HDOT), County of Maui, partners, and community the future of this existing Honoapi'ilani (makai) highway as a place where people and nature thrive. We see the opportunity to utilize nature-based solutions for preservation and restoration of the coral reef, shorelines, wetlands, recreational spaces, and infrastructure.. We have published several reports that may be useful: one on sediment sources, another on wetland extent, and a third on 2022 coral reef surveys.

Coral reef and wetland ecosystems are in need of protection

Coral reef ecosystems are key to protecting the shoreline from waves and storm impacts, including the current highway, and these systems are threatened by both global and local stressors. Recent studies show that coral larvae are struggling to find places to settle in the sedimented benthos, and that adult corals are subject to sediment and heat stressors. Coral cover remains reduced compared to the 2010s. Corals are not only organisms to protect, they also protect our coastal infrastructure from wave events and sea level rise (Storlazzi et al 2019). Once abundant wetlands in the area are important habitat for endangered waterbirds and plants and serve to provide hazard mitigation in coastal areas, such as absorption and filtering of surface waters and flood reduction. Upland forests both protect soils from erosion and provide essential groundwater recharge function to provide water for nature and people.

Sedimentation damages coral reefs

Sediment is one of the most pervasive and damaging threats to coral reef. A recent geomorphological survey by TNC demonstrated that the Pāpalaua watershed is the most degraded watershed in the area, and one of the largest contributors to sediments downstream. Upland shrublands have been decimated by fire and drought in the last twenty years, leading to orders of magnitude higher levels of erosion compared to previous centuries. Former native forest that grew on highly erodible soils in the upland bog have been lost, especially along the edges of the Pāpalaua and Manawaipueo stream basins. Data from the water quality monitoring group Hui O Ka Wai Ola show that all of the coastal areas in the Olowalu-Ukumehame region are above the state coastal turbidity standard, while Ukumehame stream has been highlighted since 2001 (and as recently as 2022) by the Hawai‘i Department of Health as an impaired stream because of turbidity.

What TNC is doing to help

Olowalu: The Road to Resilience - Community Design for the Existing Highway and Surrounding Areas
The planned HHIP provides opportunities to re-imagine the Olowalu-Ukumehame coastal corridor by incorporating park spaces, traditional biocultural practices, and nature-based solutions for coastal resiliency This project aims to strengthen coastal ecosystems, reduce pressures on the Olowalu-Ukumehame reef system, and improve resilience in the area that includes the existing roadway to adapt to climate change effects, including sea level rise. Through research, analysis, and engagement with stakeholders and community, TNC and University of Hawai`i Community Design Center are leading a process culminating in a conceptual design for local and state stakeholders as the effects of climate change threaten the shoreline.

Through the recently completed first phases of community engagement, specifically referencing the HHIP, we received comments from over 80 participants who voiced common concerns regarding disturbance of cultural resources or `iwi kūpuna as the preferred alternative is pursued; disturbance to Ukumehame Wetlands and native species by the preferred alternative; the desire for sustained access to the shoreline between the new alternative and the existing highway; and concerns around management and maintenance of the land areas between the “old” and the “new” roadways in order to prevent fire, illegal dumping and human encampments. We look forward to working together to help address some of these concerns as our respective projects progress.

We appreciate the ongoing support of HDOT as this project moves forward. For more information, please refer to the project engagement website at:
https://storymaps.arcgis.com/stories/2ba79613d0aa4da182fe9bc34cc10cc7

Collaboration on wetland and mauka restoration
A primary threat to reef health comes not from the sea but from the mountains above: sediment is carried in surface water from mauka lands impacted by non-native feral ungulates, poor land use practices, and fire. These stressors contribute to habitat degradation and erosion. The DLNR Division of Forestry & Wildlife (DOFAW) is embarking on a three-year NOAA Transformational Habitat project, "Olowalu Mauka to Makai," which will implement a full suite of ecosystem-based, mauka-to-makai conservation measures. With DOFAW, TNC will partner with Kipuka Olowalu and Coral Reef Alliance on projects including wetland restoration planning, sediment management, and community engagement, working to address threats and hazards throughout the Olowalu and Ukumehame ahupua`a.

This project is inter-related with and impacted by the realignment project, so we look forward to continued communication and collaboration with you as our projects progress.

For more information, please refer to: https://dlnr.hawaii.gov/dofaw/

Comments for the EIS

1. ***Protect Pāpalaua-Ukumehame wetlands***

The degraded wetlands of Pāpalaua and Ukumehame are important for both flood water and sediment retention, and have historically been a crucial part of the Ukumehame watershed hydrologic system. According to local knowledge-keepers, Ukumehame once had thriving wetlands that were home to endangered waterbirds like ae'o and 'alae 'ula, whose habitat along the leeward Maui coast has been reduced by agriculture, development and drought. The draft EIS highlights vestige native plant communities that are surviving in the reduced footprint of the former wetlands, including akulikuli, 'ae'ae, naupaka and milo. Sea level rise is expected to expand the area into where the bypass is proposed to go, and groundwater levels will rise.

We will be working with DOFAW on wetland restoration planning in two State parcels that will be affected by the bypass. We agree with the assessment of Ansari and Erickson documented in Section 3.9.3.1 of the prime wetland areas, and we ask you to also consider that ewe identified a broader buffer of wetlands in the regions (Maui Environmental Consultants, 2024).

We appreciate the comment that "new construction in wetlands and floodplains is to be avoided unless there is no practicable alternative to the construction." (3.9-24), and advocate for HDOT to make all efforts to reduce impact to current, former, and potential wetlands, and the proposed wetland restoration area.

We strongly advocate that the highway realignment include a viaduct to bypass the existing wetland areas. Wetland areas will likely expand in the future, and existing restoration planning would be adversely affected by the realignment without a viaduct. In particular, wetland birds would struggle to find habitat next to the highway. Efforts to avoid these vital wetlands, as habitats, ecosystems, and areas to retain land-based sediments and remove pollutants would align with the aims of the partners currently working in the area.

Ukumehame Wetlands, January 2024. Photo Credit: Dr. Kim Falinski, TNC

2. ***Reduce sediments and increase groundwater infiltration***

We commend efforts to reduce erosion during the project, and advocate for watershed-scale efforts to reduce erosion in the project area more broadly as a strategy to protect the reef. As identified in the draft EIS, the area is comprised of fine alluvial sediments, which are sensitive to disturbance and removal of vegetation. We hope to not only reduce short term sedimentation, but to create a landscape that is more efficient at reducing sediment in the longer term.

Maintain the efficiency of Pāpalaua Retention Basin

The maintenance and preservation of sediment retention basins is one of the key methods to hold back sediment in the near-term, as outlined by the West Maui Community Plan, and is the primary intervention needed for Pāpalaua.

The Pāpalaua basin serves as the primary retention basin for the Makiwa gulch intermittent stream. The basin has been shown to be a large contributor of fine sediments due to degraded upland conditions. The basin was installed in 1999, and has since filled with sediment above the original height of the standpipes, and has not received regular maintenance. It is at risk of overflow in every storm event, delivering sediment directly into coastal waters. For larger flows the basin is undersized. Additional retention capacity through maintenance and possible redesign is needed to prevent further ecosystem damage to the coral reef.

The proposed preferred alternative in Ukumehame reduces the footprint of the basin. Increased attention to replacing the sediment retention capacity is needed. We recommend considering drainage plans upland of the proposed bypass to serve as additional areas for retention. In addition, we would hope that the project would instigate a reconsideration of operations and maintenance of the existing basin, the redevelopment of culverts, and a re-design of the volume of the basin to make sure that it is the most efficient possible for protecting the downstream reef from sedimentation.

Coastal waters adjacent to Pāpalaua retention basin affected by the overflow of the basin during a 2-year storm event. Photo Credit: Jon Brito

Incorporate nature-based solutions alongside best practices for stormwater management
The proposed alternative builds would traverse the Olowalu and Ukumehame landscapes approximately along elevation. To address the main threats for the region – namely sedimentation to the reef and future drought/flooding cycles – best management practices for stormwater, groundwater and surface flows that exceed County design standards are needed to protect ecosystem health, along with operations and maintenance plans that are practicable and have clear ownership models.

In particular, we recommend that where possible, drainage swales that incorporate grasses and plants that can hold back sediment be used, or a similar nature-based alternative. If possible, the grading plans can include earthen berms to disperse water more broadly for infiltration. We recommend that the goal for the drainage system be to infiltrate water or deliver it to the wetland instead of shunting it quickly to the ocean. The conceptual study conducted (p. 3.9-25) was not included in the Appendices, so at this point it is not clear on how to collaborate to improve those BMPs to increase infiltration or sediment holding capacity.

The draft EIS refers to using 100-yr storms for bridges and 50-yr storms for culverts. It would be important to consider the effects of increased storm intensity, especially for culverts, and how this may impact overall sediment movement on the landscape. The 2018 floods in Kauai showed that large storm events can alter the coastal ecosystem trajectories for many years, if not decades (Rodgers et al 2021). Careful planning may be able to mitigate some of these concerns.

3. ***Stream crossing mitigation***

Ukumehame and Olowalu streams have been identified by the State of Hawai‘i Division of Aquatic Resources (DAR) as important for their aquatic species diversity, with over five species of native fish and invertebrates found in both streams. Hawai‘i’s native stream animals have amphidromous life cycles meaning that they spend their larval stages in the ocean (salt water), then return to freshwater streams to spend their adult stage and reproduce. Newly hatched fish larvae are carried downstream to the ocean where they become part of the planktonic pool in the open ocean. The larvae remain at sea from a few weeks to a few months, eventually migrating back into a fresh water stream as juvenile *hinana*, or post larvae. The ability for juvenile fish to migrate upstream is critical to population success. Minimizing long stretches of concretized stream and incorporating small pools and riffles with artificial materials would help to make sure larvae can make it upstream to their final habitat.

The draft EIS proposes that either “BMPs that have either been preapproved or coordinated with regulated agencies” be used to minimize water quality effect to the streams (p. 7-4) We would add, though, that the BMPs to assist o’opu migration may be different than those used to mitigate water quality impairment. Consultation with the Division of Aquatic Resources for guidance on best construction may be needed to make the stream habitat functional for Hawaii’s stream organisms.

We advocate that the alternative road scenario be carefully planned to ensure that key bridge crossings are ecologically sound for o’opu `akupa and other diadramous native species.

`O`opu `akupa (Eleotris sandwicensis), Hawaii’s only endemic eleotrid. Photo Credit: DLNR stock photo

Recommendations

Given the importance of the above factors, we make the following recommendations for mitigation measures:

1. **Preserve the maximum extent of former, current, and potential wetlands; (Section 3.9.8)**

We support the creation of a viaduct to reduce disruption to the wetland to support future wetland restoration actions on TMKs 48002002, 48002039 48002045, 48002046 and 48002047.

2. **Preserve the sediment retention capacity of Pāpalaua basin; (Section 3.11.7)**

Replace the area used by the bypass in Pāpalaua basin with improved functionality for the area that remains. Remove existing sediments after bypass construction. Improve efficiency by supporting or developing an operations and maintenance plan. Redesign basin to increase sediment retention and flood prevention capacity.

3. **Prioritize a drainage plan that uses green infrastructure to filter stormwater and increases groundwater infiltration (Section 3.12.6)**

Consider drainage systems on the upland side of the bypass that use nature-based approaches to capturing sediment and infiltrating groundwater, such as green-grey drainage swales and vegetated buffers for velocity dissipation.

4. **Build ecologically sensitive stream crossings at Ukumehame and Olowalu streams. (Section 3.9.8)**

If a stream needs to be hardened at the crossover, consider best practices for keeping stream cool, shaded, and oxygenated. The crossings at Olowalu, Ukumehame, and intermittent Pāpalaua streams must be carefully designed for water flow as well as preservation and maintenance of biological processes.

Summary

The Nature Conservancy is invested in working with community, State, and County partners on the restoration and revitalization of the Olowalu and Ukumehame ahupua‘a from mauka to makai. We look forward to working with you as a partner to ensure lasting benefits for people and nature.

Thank you for your consideration,

Emily J. Fielding
Hawai‘i Marine Conservation Director

Kim Falinski, PhD, PE
Coastal and Estuarine Scientist

cc: Federal Highway Administration, Hawaii Division
Attention: Ken Tatsuguchi, Head Planning Engineer
ken.tatsuguchi@hawaii.gov

RICHARD T. BISSEN, JR.
Mayor

SHAYNE R. AGAWA, P.E.
Director

ROBERT SCHMIDT
Deputy Director

MICHAEL KEHANO, P.E.
Solid Waste Division

ERIC A. NAKAGAWA, P.E.
Wastewater Reclamation Division

Environmental Protection &
Sustainability Division

Comment Log Submission No. 80

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2145 KAOHU STREET, SUITE 102
WAILUKU, MAUI, HAWAI'I 96793

February 24, 2025

Mr. Ken Tatsuguchi, Project Manager
State of Hawaii, Department of Transportation, Highways Division
869 Punchbowl Street, Room 301
Honolulu, Hawai'i 96813
ken.tatsuguchi@hawaii.gov

Dear Mr. Tatsuguchi:

SUBJECT: **HONOAPIILANI HIGHWAY IMPROVEMENTS DEIS COMMENTS**

Thank you for the opportunity to comment on the Honoapiilani Highway Improvements Draft Environmental Impact Statement (DEIS). The County of Maui, Department of Environmental Management has the following comments related to the Honoapiilani Highway Improvements DEIS:

- A portion of the proposed "common" route appears to encroach onto landfilled waste along the toe of closed Olowalu Landfill. Constructing structures and roadways on landfilled waste should be avoided. Please advise if this project does plan to place the improved highway on top of landfilled waste at the Closed Olowalu Landfill.
- The proposed route also appears to pass through the existing Olowalu Convenience Center (OCC) at the Closed Olowalu Landfill. OCC is the only recycling and waste transfer station for the West Maui community. Please advise if the OCC will be affected, and if so, the plan to relocate the OCC to another location to allow the County of Maui to continue providing this service to the local community.

Should you have any questions or comments, please contact Sage Kiyonaga, Solid Waste Engineer, at (808) 270-7941.

Sincerely,

for SHAYNE R. AGAWA, P.E.
Director, Department of Environmental Management

Comment Log Submission No. 81

From: Julie Parks <jparks@earthjustice.org>
Sent: Monday, February 24, 2025 1:32 PM
To: Gov.Transmit.Docs <transmit.docs@hawaii.gov>; Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; Small, Matthew T. <Matthew.Small@wsp.com>
Cc: Kaakua, Laura HE <Laura.HE.Kaakua@hawaii.gov>; Mahesh Cleveland <mcleveland@earthjustice.org>; Kylie Wager Cruz <kwager@earthjustice.org>
Subject: [EXTERNAL] Honoapi‘ilani Highway Improvements Project, West Maui: Ukumehame to Launiupoko—Draft Environmental Impact Statement

Aloha:

Earthjustice submits the attached public comments and Attachments A-E on the proposed Honoapi‘ilani Highway Improvements, West Maui: Ukumehame to Launiupoko (the “Honapi‘ilani Project” or “Project”), for which a draft environmental impact statement (“DEIS”) was published in The Environmental Notice on January 8, 2025.

Thank you.

Julie Powers Parks
Litigation Assistant
Earthjustice Mid-Pacific Office
808-599-2436

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EARTHJUSTICE

February 24, 2025

Electronically Submitted & Emailed

Governor Josh Green, M.D.
State of Hawai'i
transmit.docs@hawaii.gov

Ken Tatsuguchi
Department of Transportation, Highways Division
State of Hawai'i
ken.tatsuguchi@hawaii.gov

Matthew Small
WSP USA
matthew.small@wsp.com

Re: Honoapi'ilani Highway Improvements Project, West Maui: Ukumehame to Launiupoko—Draft Environmental Impact Statement

Dear Governor Green, Mr. Tatsuguchi, and Mr. Small,

Earthjustice submits the following public comments on the proposed Honoapi'ilani Highway Improvements, West Maui: Ukumehame to Launiupoko (the "Honapi'ilani Project" or "Project"), for which a draft environmental impact statement ("DEIS") was published in The Environmental Notice on January 8, 2025.

Earthjustice commends the Hawai'i Department of Transportation ("HDOT") for proactively responding to the climate crisis by undertaking the complex endeavor of realigning portions of the Honoapi'ilani Highway that are highly vulnerable to sea level rise and coastal hazards, and that serve as the main artery to West Maui in an area of high cultural, archaeological, ecological, and recreational significance. We also continue to value and acknowledge HDOT for its groundbreaking leadership and commitments to decarbonizing the state transportation system in accordance with state law and the landmark settlement in the youth-led climate lawsuit *Navahine F., et al. v. Dep't of Transp.*, 1CCV-22-0000631 ("*Navahine* Settlement"), appended hereto as Attachment A.

The Honoapi'ilani Project presents a historic opportunity for HDOT to create a best-in-class model for *adapting* to climate change (*i.e.*, sea level rise and coastal hazards), while at the same time also *mitigating* climate change by incorporating sensible bicycle and pedestrian-friendly measures that would ultimately reduce car traffic and greenhouse gas emissions, while

promoting public health and mobility for Hawai'i's residents. We offer these comments to enhance the Project's climate benefits, and to allow for full consideration of its climate-related impacts, mitigation measures, and alternatives through the environmental review process.

HDOT Should Disclose and Mitigate the Project's Climate Change Impacts, Consistent With the *Navahine* Settlement.

The *Navahine* Settlement contains provisions to decarbonize the state transportation system through HDOT's transportation projects and their prerequisite environmental review documents. These provisions are key components of the settlement's broader vision, commitment, and roadmap to achieve "zero [greenhouse gas] emissions across all transportation modes within the State," including from "ground transportation" under Haw. Rev. Stat. ("HRS") § 225P-8.[1] HDOT's environmental review of the proposed Honoapiʻilani Project should contain analyses and mitigation measures to reduce greenhouse gas emissions, consistent with the *Navahine* Settlement and state law.

For example, the *Navahine* Settlement requires HDOT to "implement policies and procedures to ensure that *Complete Streets improvements remain part of the project* throughout the planning and development process."[2] Hawai'i's Complete Streets statute requires HDOT to "adopt a complete streets policy that seeks to *reasonably accommodate convenient access and mobility for all users of the public highways*," including "pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities."[3] The mandate applies specifically to "new construction, reconstruction, and maintenance" of highways such as the Honoapiʻilani Project.[4] The Honoapiʻilani Project, as proposed in the DEIS, lacks any Complete Streets improvements for pedestrians, bicyclists, and transit users. The DEIS specifically states that "[t]he Project *does not include* bicycle lanes or other bicycle or pedestrian facilities for any of the Build Alternatives."[5] The DEIS further notes that once the realignment is complete, the affected portions of the existing Honoapiʻilani Highway will be deeded to County of Maui ("County")[6] for use in conjunction with the West Maui Greenway Plan for a coastal bicycle and pedestrian pathway from Līpoa Point to Ukumehame,[7] while acknowledging that "*formal plans have not been developed*."[8]

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[1] *See also Navahine* Settlement at 4.

[2] *Navahine* Settlement at 8 (emphasis added).

[3] HRS § 264-20.5(a) (emphasis added).

[4] *Id.* § 264-20.5(b).

[5] DEIS vol. 3 at 3.14-39 (emphasis added).

[6] DEIS Appendices at PDF 1871.

[7] West Maui Greenway Work Plan (2022) ("WMG Plan") at 7, https://mauimpo.org/west-maui-greenway-plan-0 (last visited Feb. 21, 2025).

[8] DEIS vol. 3 at 3.14-39 (emphasis added). We note that any such potential coastal bicycle and pedestrian pathway would be subject to the very sea level rise threats that the

Deeding the existing highway to the County without any certainty or commitments around what will happen to it afterward, while also building a new highway without any designated bike or pedestrian facilities, runs the risk of creating a second roadway or bypass without any Complete Streets accommodations on either. It would also impede compliance with the *Navahine* Settlement's requirement for HDOT to "complete the pedestrian, bicycle, and transit networks in coordination with the counties as contemplated under HRS § 264-142, with a goal of completing this work in five years."[9] Given that federal and other funding for the West Maui Greenway Plan is uncertain, HDOT should provide funding for the West Maui Greenway Plan Segments 6 and 7, which would be located on or along the portions of the existing highway that will be deeded to the County[10] and have not yet been funded. HDOT should also include a shaded, protected bike and pedestrian pathway through the center of the realigned highway to comply with the *Navahine* Settlement and Complete Streets mandate and ensure this $160.8M[11] Project contributes to decarbonizing the state transportation system. This pathway should provide for integration and linkages with the West Maui Greenway, in consultation with stakeholders. Indeed, providing bike and pedestrian facilities in *both* the original *and* realigned highways—both of which are contemplated to be (re)constructed in this case—would maximize multimodal accommodations and properly comply with the Complete Streets mandate and other state laws.

The *Navahine* Settlement further requires HDOT to "develop and implement an objective, ***scientifically-based methodology*** to assess and report the total, long-term [greenhouse gas] emission and [vehicle miles traveled] impacts of each infrastructure project,"[12] specifically for use in "preparing ***environmental review documents*** for its transportation projects."[13] Such analyses are not included in the DEIS.[14] Given that HDOT must develop and implement this methodology by April 2025,[15] any subsequent environmental review documents should disclose these Project impacts. HDOT should specifically consider and compare the greenhouse gas emissions and vehicle miles traveled impacts of (1) constructing the new

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Honoapi'ilani Project seeks to evade and, thus, would not provide a lasting accommodation for bike and pedestrian mobility and access.

[9] *Navahine* Settlement at 9; *see also* HRS § 264-142 (requiring HDOT to create a "contiguous network" of bikeways and walkways throughout each island, in coordination with the counties).

[10] WMG Plan at 111.

[11] DEIS vol. 1 at S-20.

[12] *Navahine* Settlement at 7 (emphasis added).

[13] *Id.* at 8 (emphasis added).

[14] The DEIS's treatment of "air quality" impacts does not contain this objective, science-based acknowledgement of the long-term impacts of capacity expansion and, instead, is limited to an unsupported conclusion that the Honoapi'ilani Project would reduce greenhouse gas emissions by increasing speeds, reducing congestion, and improving level of service, DEIS vol. 3 at 3.15-9, 3.15-15.

[15] *Navahine* Settlement at 7.

highway while closing or keeping the existing highway open to motorist traffic, and (2) including or omitting bike and pedestrian facilities on the existing and new highways. These analyses will enable full disclosure of the Honoapi'ilani Project's impacts, as well as informed consideration of mitigation measures and alternatives.

The *Navahine* Settlement further mandates that "***Level of Service is discontinued*** as a criterion for project prioritization,"[16] which goes hand-in-hand with the requirement to instead assess each project's greenhouse gas and vehicle miles traveled impacts. As the youth highlighted in *Navahine*, level of service, a metric assessing how quickly cars move along a roadway, "promotes projects that induce additional traffic and ultimately increase congestion over time and imposes blind spots and barriers against multimodal projects."[17] Any subsequent environmental review documents should avoid use of or reliance on level of service to evaluate the Honoapi'ilani Project.[18]

HDOT Should Disclose and Consider Alternatives that Account for Updated Sea-Level Rise Projections.

HDOT's stated purpose and need for realigning the Honoapi'ilani Highway is "to address existing coastal erosion and flooding vulnerabilities as well as future coastal erosion and flooding caused by anticipated sea level rise."[19] Indeed, around two-thirds of the highway span proposed for realignment "are considered exposed and potentially vulnerable to sea level rise."[20] HDOT acknowledges that, among a variety of potential hazards to transportation infrastructure in West Maui, sea level rise is "the most urgent," while the associated risks of passive flooding, storm surges, and coastal erosion are already occurring and predicted to worsen.[21]

To fulfill the Project's stated purpose and need to adapt to sea level rise, HDOT should disclose and consider alternatives that account for updated sea level rise projections. The alternatives considered in the DEIS are all based on the conservative assumption that ocean levels will rise by 3.2 feet by 2100.[22] More recent estimates, however, predict that sea level may

[16] *Id.* at 8 (emphasis added).

[17] Replogle Second Amended Expert Report at 33, appended hereto as Attachment B.

[18] Although HDOT does not include improving the level of service in the stated "purpose and need" for the Honoapi'ilani Project, the DEIS appears to continue to use this metric in evaluating the Project and its alternatives. *See, e.g.*, DEIS vol. 3, at 3.14-54.

[19] DEIS vol. 1 at 1-7.

[20] *Id.*

[21] *See id.* at 1-10.

[22] *See* DEIS vol. 3 at 3.13-3, 3.13-5.

rise by closer to 4 feet and by as much as 6 feet by 2100,[23] which would move the projected sea level rise inundation area further mauka. HDOT should disclose these updated sea level projections and consider alternatives that plan for and adapt to them. Along these lines, HDOT should consider the costs and risks of *underestimating* sea level rise, including the estimated costs of having to relocate the Honoapi‘ilani Highway again in the event of sea level rise exceeds 3.2 feet by 2100.

HDOT Should Disclose and Mitigate the Climate Change Effects from Leaving the Existing Highway In Place.

The DEIS acknowledges the harm that climate change and sea level rise are “already causing to the existing highway,”[24] but does not discuss how relinquishing the existing highway to the County will affect the environment. So long as the County keeps the existing highway in place and sea levels continue rising, the existing highway will increasingly serve as shoreline armoring that would harm beach and reef ecosystems, including monk seal habitat.[25] HDOT should, at minimum, consider these harmful effects and measures to mitigate them.

HDOT Should Disclose the Honoapi‘ilani Project’s Reasonably Foreseeable Growth-Inducing Effects

As discussed in our December 23, 2022 scoping comments, appended hereto as Attachment E, HDOT should disclose and analyze any reasonably foreseeable growth-inducing effects from the Honoapi‘ilani Project. For example, to the extent that any plans to develop Olowalu Town are still in the works and would be dependent on implementing the Honoapi‘ilani Project, HDOT must address these effects.[26]

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[23] State of Hawai‘i Office of Conservation and Coastal Lands, *Hawai‘i Sea Level Rise Vulnerability and Adaptation Report, 2022 Update*, at 28, appended hereto as Attachment C (“Agencies should incorporate the revised planning benchmarks [*i.e.*, 4 feet minimum scenario and 6 feet for public infrastructure projects] into adaptation planning to account for the more accurate regional projections prior to the availability of revised SLR-XA data as possible.”); *see also* National Oceanic and Atmospheric Administration, *Global and Regional Sea Level Rise Scenarios for the United States*, appended hereto as Attachment D (2022).

[24] DEIS vol. 1 at S-7.

[25] *See* DEIS vol. 3 at 3.10-11.

[26] *See, e.g.*, Haw. Admin. R. § 11-200.1-2 (requiring analysis of indirect effects, also termed “secondary effects” or “secondary impacts”); *Kia‘i Wai v. Dep’t of Water*, 151 Hawai‘i 442, 455, 517 P.3d 725, 738 (2022) (requiring disclosure and analysis of “reasonably foreseeable” growth-inducing effects); *Barnes v. U.S. Dep’t of Transp.*, 655 F.3d 1124, 1139 (9th Cir. 2011) (“agencies must analyze the impacts of the increased demand attributable to the [infrastructure project] as growth-inducing effects falling under [the National Environmental Policy Act’s] purview”).

We appreciate the opportunity to comment on the Honoapiʻilani Project, which could be precedent-setting for proactively adapting to climate change, while incorporating sensible and timely design measures to reduce greenhouse gas emissions from transportation. Please contact us if you have any questions or would like to discuss this further.

Respectfully submitted,

/s/ Mahesh Cleveland
Isaac Moriwake
Kylie Wager Cruz
Mahesh Cleveland
EARTHJUSTICE

Attachments (A – E)

cc: Laura Kaʻakua, State of Hawaiʻi Department of Transportation

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Attorneys for Plaintiffs

IN THE CIRCUIT COURT OF THE FIRST CIRCUIT

STATE OF HAWAI‘I

NAVAHINE F., a Minor, by and through her natural guardian; et al., Plaintiffs, v. DEPARTMENT OF TRANSPORTATION, STATE OF HAWAI‘I, et al., Defendants.	) CIVIL NO. 1CCV-22-0000631) (Environmental Court))) JOINT STIPULATION AND ORDER) RE: SETTLEMENT; EXHIBIT “A”)) Judge: The Honorable John M. Tonaki)) Trial Date: June 24, 2024))))

ATTACHMENT A

JOINT STIPULATION AND ORDER RE: SETTLEMENT

WHEREAS, Plaintiffs Navahine F., a Minor, by and through her natural guardian; Kaʻōnohi P.-G., a Minor, by and through his natural guardian; Kawahineʻilikea N., a Minor, by and through her natural guardian; Mesina D.-R., a Minor, by and through her natural guardian; Kawena F., a Minor, by and through her natural guardians; Tyler L., a Minor, by and through their natural guardian; Rylee K., a Minor, by and through her natural guardian; Kaliko T., a Minor, by and through her natural guardian; Charlotte M., a Minor, by and through her natural guardian; Taliya N., a Minor, by and through her natural guardian; Kalālapa W.; Pahonu C., a Minor, by and through his natural guardian; and Brianna K., a Minor, by and through her natural guardian (collectively, "Youth Plaintiffs") and Defendants the State of Hawaiʻi, Governor Josh Green, the Hawaiʻi Department of Transportation ("HDOT"), and Edwin Sniffen, in his official capacity as HDOT Director (collectively, "Defendants"), have executed a Settlement Agreement, which is filed herewith as Exhibit "A";

NOW, THEREFORE, pursuant to the Settlement Agreement, the parties hereby stipulate and agree, and the Court orders, as follows:

1. The terms of the Settlement Agreement are approved as in the best interests of and fair to the Youth Plaintiffs.
2. Except as set forth in the Settlement Agreement, this Order and Settlement Agreement fully and completely resolve the claims asserted by Plaintiffs against Defendants in the Youth Plaintiffs' Complaint (Dkt. 1).
3. In the event a dispute arises regarding compliance with the terms of the Settlement Agreement, any party, having complied with the dispute resolution provisions set forth in section 10 of the Settlement Agreement, may bring an appropriate motion in this Court

under Case Number 1CCV-22-0000631 to enforce the Agreement. Unless otherwise directed by this Court, the moving party shall not commence a separate lawsuit to seek judicial resolution of such a dispute.

4. This Court shall reserve continuing jurisdiction solely to enforce the Parties' obligations under the Agreement until December 31, 2045, or the date upon which the Zero Emissions Target, Haw. Rev. Stat. § 225P-5, has been achieved, whichever is earlier.

5. This case shall automatically be dismissed on December 31, 2045, or the date upon which the Zero Emissions Target, Haw. Rev. Stat. § 225P-5, has been achieved, whichever is earlier.

DATED: Honolulu, Hawai'i, May 17, 2024.

ANNE LOPEZ
Attorney General of the State of Hawai'i

/s/ Isaac H. Moriwake
ISAAC H. MORIWAKE
KYLIE W. WAGER CRUZ
LEINĀ'ALA L. LEY
EARTHJUSTICE

ANDREA RODGERS (*Pro Hac Vice*)
JOANNA C. ZEIGLER
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OUR CHILDREN'S TRUST

PHILIP L. GREGORY (*Pro Hac Vice*)
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MEGAN A SUEHIRO
MORGAN, LEWIS, & BOCKIUS LLP

Attorneys for Defendants

APPROVED AND SO ORDERED:

DATED: Honolulu, Hawai‘i June 20, 2024

/s/ John M. Tonaki

JOHN M. TONAKI
JUDGE OF THE ABOVE-ENTITLED COURT

EXHIBIT A

EXHIBIT A

SETTLEMENT AGREEMENT AND RELEASE

This Settlement Agreement and Release (the "Agreement") is made and entered into by and between **Plaintiffs** Navahine F., a Minor, by and through her natural guardian; Ka'ōnohi P.-G., a Minor, by and through his natural guardian; Kawahine'ilikea N., a Minor, by and through her natural guardian; Mesina D.-R., a Minor, by and through her natural guardian; Kawena F., a Minor, by and through her natural guardians; Tyler L., a Minor, by and through her natural guardian; Rylee K., a Minor, by and through her natural guardian; Kaliko T., a Minor, by and through her natural guardian; Charlotte M., a Minor, by and through her natural guardian; Taliya N., a Minor, by and through her natural guardian; Kalālapa W.; Pahonu C., a Minor, by and through his natural guardian; and Brianna K., a Minor, by and through her natural guardian (collectively, "Youth Plaintiffs"), and **Defendants** the State of Hawai'i, Governor Josh Green, the Hawai'i Department of Transportation ("HDOT"), and Edwin Sniffen, in his official capacity as HDOT Director (collectively, "Defendants").

Youth Plaintiffs and Defendants shall be referred to collectively as the "Parties" and individually as a "Party."

RECITALS

WHEREAS, Youth Plaintiffs are thirteen youths represented by two non-profit, public interest law firms, Earthjustice and Our Children's Trust;

WHEREAS, Youth Plaintiffs filed a Complaint on June 1, 2022, captioned *Navahine F. et al. v. Hawai'i Department of Transportation et al.,* in the Circuit Court of the First Circuit, Case No. 1CCV-22-0000631, alleging violations of the constitutional public trust doctrine (Haw. Const. art. XI, § 1) and constitutional right to a clean and healthful environment (Haw. Const. art. XI, § 9) and seeking declaratory and injunctive relief;

WHEREAS, on April 17, 2023, Defendants filed an Answer denying liability;

WHEREAS, at the time the case commenced, Youth Plaintiffs were children, ages 9-18;

WHEREAS, Hawai'i jurisprudence recognizes that:

> "There is scientific consensus: anthropogenic global warming threatens the world's climate system. It raises the seas; it sickens the planet. It harms present and future generations." *In re Maui Elec. Co.,* 150 Hawai'i 528, 538 n.15, 506 P.3d 192, 202 n.15 (2022) ("*MECO*") (citing *Summary for Policymakers* in *Climate Change 2021: The Physical Science Basis*, IPCC (Valérie Masson-Delmotte et al. eds., 2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf; *Summary for Policymakers* in *Climate Change 2022: Impacts, Adaptation and Vulnerability* at SPM-7-8, IPCC (Hans-O Pörtner et al., 2022), https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_SummaryForPolicymakers.pdf);

"The people of Hawai‘i have declared ‘a climate emergency.’" *In re Haw. Elec. Light Co.*, 152 Hawai‘i 352, 359, 526 P.3d 329, 336 (2023) ("*HELCO*") (quoting S. Con. Res. 44, 31st Leg., Reg. Sess. (2021) ("2021 S. Con. Res. 44"));

"Hawai‘i faces immediate threats to our cultural and economic survival: sea level rise, eroding the coast and flooding the land; ocean warming and acidification, bleaching coral reefs and devastating marine life; more frequent and more extreme droughts and storms. For the human race as a whole, the threat is no less existential." *HELCO*, 152 Hawai‘i at 359, 526 P.3d at 336 (citing 2021 S. Con. Res. 44);

"HRS § 225P-5 mandates that we reduce emissions now, before the damage done to the environment is irreversible—before action becomes impossible for future generations." *HELCO*, 152 Hawai‘i at 358, 526 P.3d at 335;

"With each year, the impacts of climate change amplify and the chances to mitigate dwindle … ‘A stepwise approach is no longer an option.’" *HELCO*, 152 Hawai‘i at 359, 526 P.3d at 336 (internal citation omitted); and

WHEREAS, as a state agency, HDOT "must perform its statutory function in a manner that fulfills the State's affirmative constitutional obligations." *HELCO*, 152 Hawai‘i at 359, 526 P.3d at 336;

WHEREAS, an array of laws enacted by the Hawai‘i Legislature require the State to increase energy efficiency, develop an integrated multi-modal transportation system, and reduce greenhouse gas ("GHG") emissions, including transportation sector emissions specifically. *See*, *e.g.*, HRS §§ 196-9; 225P-5, -7, -8; 226-17, -18; 264-142, -143;

WHEREAS, Hawai‘i's Legislature has recognized that:

"[C]limate change is the overriding challenge of the twenty-first century" and "poses immediate and long-term threats to Hawai‘i's economy, public health, natural resources, environment, and way of life." 2022 Haw. Sess. Laws Act 238, § 1;

"[B]ased upon the scientific information and expertise available, Hawai‘i remains particularly vulnerable to the dangers of disaster occurrences as a result of the effects of global warming, thereby endangering the health, safety, and welfare of the [State's] people, warranting preemptive and protective action[.]" 2021 S. Con. Res. 44; and

"In order to achieve the goal of a fully decarbonized economy, the State needs to plan ahead and understand the steps that need to be taken to create a carbon-negative economy by 2045[.]" 2022 Haw. Sess. Laws Act 238, § 1;

WHEREAS, Hawai‘i's Legislature has further found that this "existential climate emergency threatens humanity and the natural world" and has requested "statewide collaboration toward an immediate just transition and emergency mobilization effort to restore a safe climate." 2021 S. Con. Res. 44;

WHEREAS, Defendants have taken efforts to make Hawai‘i a leader in reducing GHG emissions in the transportation sector, and are committed to taking further, ambitious steps to meet the State's targets set forth in HRS §§ 225P-5, -7, and -8;

WHEREAS, a 2023 study by EPA found that children are uniquely vulnerable to the impacts of climate change because of the natural physiology of their developing and growing bodies, and that climate change impacts experienced during childhood can have lifelong consequences. U.S. Environmental Protection Agency, *Climate Change and Children's Health and Well-Being in the United States*, EPA 430-R-23-001 (2023);

WHEREAS, experts state that the best scientific evidence today shows that correcting Earth's energy imbalance requires reducing atmospheric carbon dioxide to less than 350 parts per million this century;

WHEREAS, the Parties have agreed to fully and finally resolve Youth Plaintiffs' Complaint in exchange for certain commitments by Defendants related to reducing GHG emissions in the transportation sector; and

WHEREAS, by entering this Agreement, Youth Plaintiffs do not admit to any legal or factual deficiencies in their claims and Defendants do not admit to any liability or wrongdoing and do not concede any factual or legal issue alleged in the Complaint.

NOW, THEREFORE, in the interests of the Parties and the public interest, and to promote judicial economy, the Parties hereby stipulate and agree as follows:

RECOGNITION OF RIGHTS

1. Youth Plaintiffs have constitutional rights to a clean and healthful environment consistent with article XI, section 9 of the Hawai‘i Constitution:

> Each person has the right to a clean and healthful environment, as defined by laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources. Any person may enforce this right against any party, public or private, through appropriate legal proceedings, subject to reasonable limitations and regulation as provided by law.

2. The State is committed to reducing GHG emissions from its statewide transportation system according to "the best available science" and the governing legal mandates to address climate change and protect the constitutional rights of Hawai‘i citizens. 2018 Haw. Sess. Laws Act 15, § 4.

3. The right to a clean and healthful environment under article XI, section 9 of the Hawai‘i Constitution as defined by laws relating to environmental quality "subsumes a right to a

life- sustaining climate system." *MECO*, 150 Hawai‘i at 538 n. 15, 506 P.3d at 202 n. 15; *HELCO*, 152 Hawai‘i at 359, 526 P.3d at 336.

4. The State has affirmative public trust obligations under article XI, section 1 of the Hawai‘i Constitution to conserve and protect "Hawai‘i's natural beauty and all natural resources, including land, water, air, minerals and energy sources" "[f]or the benefit of present and future generations."

5. The State's public trust considerations include "those related to protection of air and other trust resources affected by climate change[.]" *MECO*, 150 Hawai‘i at 538, 506 P.3d at 202.

6. "As trustee, the State must take an active role in preserving trust property and may not passively allow it to fall into ruin." *Ching v. Case*, 145 Hawai‘i 148, 177, 449 P.3d 1146, 1175 (2019) (citation omitted). "[A]n obligation to reasonably monitor trust property to ensure it is not harmed is a necessary component of this general duty[.]" *Id.*

7. Defendants, in establishing, maintaining, and operating the state transportation system, must preserve, protect, and maintain Hawai‘i's public trust resources and all Hawai‘i citizens' right to a clean and healthful environment.

8. 2018 Haw. Sess. Laws Act 15, section 4, requires Defendants to "expand strategies and mechanisms to reduce greenhouse gas emissions through the reduction of energy use, adoption of renewable energy, and control of air pollution among all agencies, departments, industries, and sectors, *including transportation*[,] . . . utiliz[ing] the best available science, technologies, and policies to reduce greenhouse gas emissions." (Emphasis added.)

TERMS AND CONDITIONS

NOW, THEREFORE, the Parties hereby promise, covenant, agree, and exchange mutual general releases as follows:

1. GHG Emission Reductions.

As required by HRS § 225P-8, HDOT will "take any actions necessary to achieve the goals established" in that section, specifically, "zero [greenhouse gas] emissions across all transportation modes within the State, including across all sectors of:

(1) Ground Transportation; and
(2) Sea and air interisland transportation."

The Parties agree that Defendants will establish in the GHG Reduction Plan discussed below the interim greenhouse gas emission reduction targets for 2030, 2035, and 2040 to achieve the goals established in HRS § 225P-5 "no later than 2045" in accordance with that section.

2. Greenhouse Gas Reduction Plan.

Within the legal and legislative parameters of the government process, which Youth Plaintiffs acknowledge, HDOT, in consultation with other state and local agencies, will develop and implement a concrete and comprehensive statewide plan ("GHG Reduction Plan") to reduce GHG emissions from the statewide transportation system on a timeline that complies with HRS §§ 225P-5, 225P-7, and 225P-8.

a. HDOT will complete the GHG Reduction Plan as soon as possible, but no later than one (1) year from the date of the last signatory to the Agreement ("Agreement Date").

b. Youth Plaintiffs and the public shall have at least thirty (30) days to provide feedback and comments on the GHG Reduction Plan, prior to the Plan becoming final, and sufficiently in advance for HDOT to address the feedback and comments.

c. After entry of the Parties' Agreement, Youth Plaintiffs shall have the opportunity to have an in-person meeting with the Director of HDOT and the Climate Change Mitigation and Culture Manager to discuss their comments and feedback on HDOT's GHG reduction measures.

d. The GHG Reduction Plan will acknowledge and act upon the responsibilities of the State, and HDOT as the State's head transportation agency, to play a lead role in decarbonizing the statewide transportation system, in coordination and partnership with other related agencies and entities and the private sector.

e. The GHG Reduction Plan will include consideration of plans and investments for infrastructure that may be necessary at harbors and airports to accommodate the full decarbonization of international aviation and marine transportation to the Hawaiian Islands.

f. The GHG Reduction Plan will set interim five (5) year GHG emissions reduction targets in the transportation sector through 2045, for the years 2030, 2035, and 2040. The plan will include different benchmarks for ground, air, and marine transportation, as necessary to reflect different technologies economically and technically viable in the three sectors.

g. HDOT will provide an annual update to the public, with notice specifically provided to Youth Plaintiffs through their counsel, on its progress in implementing the GHG Reduction Plan, achieving GHG emission reductions, and moving toward the upcoming GHG reduction interim target.

h. The public and Youth Plaintiffs will have at least thirty (30) days after receipt of each annual update to provide comments and feedback to HDOT. Upon request by Youth Plaintiffs, they shall have the opportunity to have an in-person or virtual meeting with the Climate Change Mitigation and Culture Manager to discuss their comments and feedback.

i. The GHG Reduction Plan will be updated on an ongoing basis, with a comprehensive review and update approximately every five (5) years, under the principle of continual performance feedback and improvement. Specifically, HDOT will review and reassess actions and strategies for ground, air, and marine transportation based on the best scientific information available, the progress to date, and the necessary adjustments to meet the upcoming five-year interim target.

j. Specific benchmarks and performance metrics to incorporate in the GHG Reduction Plan will include but not be limited to the following:

    i. Interim targets to reduce vehicle miles traveled ("VMT") and the number of single occupancy vehicles in the state's mode share, HRS § 264-143(a)(3), (4);

    ii. Interim targets to expand multimodal transportation options such as public transit, pedestrian pathways, and bikeways, HRS §§ 264-20.5(a), -142;

    iii. Interim targets to improve safety for pedestrians and cyclists and meet the Vision Zero Policy, HRS §264-143(a)(6);

    iv. Interim targets to electrify transportation and support expansion of the public charging infrastructure across the state, HRS §§ 226-17, -18;

    v. Interim targets to reduce petroleum use from ground transportation and increase the use of zero-carbon alternative fuels and electric vehicles in the ground, air, and marine transportation sectors, HRS §§ 226-17, -18;

    vi. Interim targets to convert to zero-emission technologies (whether electric or otherwise) all ground equipment at airports and harbors in the state, HRS §§ 225P-5, P-8.

k. To meet the interim targets set in the GHG Reduction Plan, HDOT will need at a minimum:

    i. Sufficient appropriations of funds by the Legislature;

    ii. Support and adoption by private stakeholders of zero emissions vehicles, sustainable aviation fuel, and other technologies;

    iii. Support by the counties for zero emissions vehicles, public transit, electric vehicle ("EV") charging, and other measures designed to decarbonize the transportation sector;

    iv. Land use and other planning to increase public adoption of multimodal transportation options;

    v. Support, planning, and adoption by other State departments, agencies, and

commissions to achieve the State's renewable energy and zero emissions transportation goals;

vi. Availability and delivery of new vehicles and technologies from private parties (such as medium- and heavy-duty electric vehicles);

vii. Public support, advocacy, and assistance in spreading awareness and education about Hawai'i's clean energy initiatives; and

viii. For the State's electrical energy to be generated using renewable energy sources according to the State's Renewable Portfolio Standards.

The GHG Reduction Plan will incorporate specific actions and strategies that HDOT will take in an effort to enable and support meeting the applicable needs set forth in sections k.i-viii above.

l. HDOT will develop and implement a program for public education, outreach and community engagement, and partnerships to support the GHG Reduction Plan and related transportation decarbonization work, emphasizing the role the public can play and maximizing awareness of clean transportation choices and opportunities. The Parties will partner in and contribute to the public education, outreach, and community engagement program.

3. Revised Transportation Programming and Budgeting Process.

a. To ensure funding is requested, available, and prioritized in alignment with decarbonizing the transportation system, HDOT will develop a process and criteria for evaluating, selecting, and prioritizing projects to include in the Mid-Range Transportation Plan ("MRTP"), Statewide Transportation Improvement Program ("STIP"), and multimodal plans, in accordance with the State's GHG mitigation and VMT reduction goals. HDOT will make information about this process and criteria readily available to the public.

b. The revised process and criteria for the MRTP and STIP will be in place and operational in time to apply to the next planning cycle beginning in April 2025.

c. HDOT will develop and implement an objective, scientifically-based methodology to assess and report the total, long-term GHG emission and VMT impacts of each infrastructure project ("the Methodology"). The Methodology will quantify these impacts where possible, using best estimates where necessary. HDOT will incorporate this Methodology into its planning process and into individual project and annual reports under HRS § 264-143.

d. HDOT will develop and implement the Methodology in no later than one year, in time for it to be incorporated in all proposals for the next planning cycle beginning in April 2025.

e. HDOT will also use this Methodology to assess GHG and VMT impacts in preparing environmental review documents for its transportation projects, and in commenting on environmental review documents for land use development projects.

f. HDOT will include climate change mitigation as a primary goal and objective within the MRTP and STIP process at the next planning cycle beginning in April 2025, to be implemented based on best available data from the GHG and VMT Methodology.

g. The revised process and criteria for the MRTP and STIP will make clear that the 2013 "Highways Division Project Prioritization Guideline" document is no longer valid, and Level of Service is discontinued as a criterion for project prioritization.

h. HDOT will produce an annual report compiling the individual project reports and detailing its progress in reducing GHG and VMT, including its quantitative analyses, as required by HRS § 264-143(c).

i. HDOT will incorporate the Complete Streets policy under HRS § 264-20.5 as a goal and prioritization criterion in the MRTP and STIP and require a documented Complete Streets assessment, including any exceptions to the Complete Streets policy, for each proposed project, starting from the upcoming MRTP and STIP planning cycle beginning in April 2025. HDOT will also implement policies and procedures to ensure that Complete Streets improvements remain part of the project throughout the planning and development process, and that information about Complete Streets improvements for each project is readily available to the public.

j. The GHG and VMT impact assessments, reports, and project scoring evaluations described above for each project and the MRTP and STIP as a whole will be publicly available in an easily accessible online format.

k. HDOT will include consideration of equity goals for each project at the planning stage and inclusion of an assessment of whether each project serves HDOT's equity goals in the reports prepared under HRS § 264-143. HDOT will mindfully prioritize the health and wellbeing of children, *see, e.g.*, HRS § 264-142(b)(1).

4. HDOT Leadership.

a. HDOT will create a lead unit, headed by a Climate Change Mitigation & Culture Manager, expressly charged with addressing climate change mitigation, within three months of this Agreement or as soon thereafter as the unit can be created. This lead unit will:

i. Work directly with HDOT Director, Deputy Directors, Climate Resiliency Managers from Airports, Highways, and Harbors to integrate and coordinate the mission of GHG reduction throughout HDOT.

ii. Lead and conduct a range of responsibilities intended to meet the goals and

targets set in HDOT's GHG Reduction Plan.

b. HDOT Highways will also create a position to oversee HDOT Highways' climate change mitigation and adaptation efforts at the program level. HDOT will also create a position to lead and coordinate efforts to ensure implementation of the Complete Streets policy, including the process improvements described above. HDOT will provide email notice to the Youth Plaintiffs, through their counsel, of the title of each position when the two positions described above are created.

c. HDOT will also establish a volunteer youth council to advise on HDOT's mitigation and adaptation commitments on a quarterly basis, with transparency about youth council recommendations and HDOT's responses. The inaugural volunteer youth council will be open to Youth Plaintiffs' participation through the regular application process and at least two of the youth council seats will be allocated to Youth Plaintiffs should they choose to apply. HDOT will provide email notice to the Youth Plaintiffs, through their counsel, when applications for the inaugural volunteer youth council open.

d. To promote decarbonization of transportation as a statewide priority, HDOT will develop, publish, and implement standards governing its external review requests. HDOT will apply the same standards used for internal HDOT projects in reviewing developer projects, including but not limited to: integration of multimodal transportation choices and connectivity of walkways and bikeways into new developments; assessment of the potential GHG and VMT impacts of proposed projects; and improvements for the construction of bikeways, pathways, transit stops, and public EV charging stations in new developments intended to mitigate the reasonably foreseeable impacts of the proposed project on the statewide transportation system, including GHG and VMT impacts.

5. Immediate Commitments.

a. To rapidly accelerate the expansion of the public EV charging network, Defendants will undertake an ambitious mobilization, including appropriate budgeting requests, in addition to implementation of HDOT's existing plan under the National Electric Vehicle Infrastructure (NEVI) Program, with an initial goal of investing a minimum of $40 million into public charging stations and charging infrastructure for state and county vehicles by 2030, subject to change as part of HDOT's GHG Reduction Plan.

b. To rapidly accelerate the expansion of multimodal transportation choices in line with the State's decarbonization goals and the accompanying co-benefits, Defendants will also undertake an ambitious mobilization, including budgeting requests, to complete the pedestrian, bicycle, and transit networks in coordination with the counties as contemplated under HRS § 264-142, with a goal of completing this work in five years.

c. HDOT will develop and implement policies intended to achieve zero emissions,

including policies designed to: (i) reduce VMT and the percentage of single occupancy vehicles on roads; (ii) electrify transportation, including all vehicles and facilities, and support expansion of charging infrastructure across the State; (iii) increase the use of zero-carbon alternative fuels and electric vehicles in the ground, air, and marine transportation sectors; (iv) expand multimodal transportation options by building the complete network of safe bicycle, pedestrian, and transit facilities; and (v) implement other strategies as needed to decarbonize the transportation sector in the timeframe set forth in HRS § 225P-5. HDOT will seek immediate opportunities to take actions to advance progress on these goals.

d. HDOT will also increase efforts to sequester more carbon, including by planting additional trees and shrubs on an annual basis to generate additional carbon sinks to drawdown carbon in the atmosphere, with a starting goal of planting at least 1,000 trees per year. When planting, HDOT will use native plants whenever feasible, and will not use invasive species.

6. Attorneys' Fees and Costs.

Each of the Parties shall bear and pay its own costs, attorneys' fees and any other expenses incurred or to be incurred in connection with this action, the released claims, the negotiation and preparation of this Agreement and/or the performance of this Agreement.

7. Notice.

Any notices required or provided for by this Agreement shall be in writing, via email or other means, and sent to the following:

a. for Defendants:

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Deputy Attorney General
Department of the Attorney General
State of Hawai‘i
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b. for Plaintiffs:

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Any Party may, by written notice to the other Parties, change its designated notice recipient or notice addresses provided above.

8. No Admissions.

The Parties and their counsel understand that this Agreement does not constitute an admission by Defendants of any current or prior violation of the Hawai'i Constitution or other violation of any law, or of any wrongdoing of any kind. This Agreement is for the purposes of resolving and settling all actual and potential disputes among the Parties to avoid further controversy, litigation and expense; provided, however, that this Agreement may be used in an action by a Party to enforce its terms and provisions.

9. Jurisdiction and Dismissal.

The Parties will prepare and file a Proposed Order for signature and entry by the Court that (i) approves the terms of the Agreement as in the best interests of and fair to the Youth Plaintiffs, (ii) declares that Plaintiffs' Complaint is fully and finally resolved, and (iii) reserves jurisdiction solely to enforce the Agreement and provides for the automatic dismissal of the case as provided herein.

The Parties agree that the Court will retain continuing jurisdiction to enforce the Parties' obligations under the Agreement until December 31, 2045, or the date upon which the Zero Emissions Clean Economy Target (HRS § 225P-5) has been achieved, whichever is earlier. This case will be automatically dismissed the sooner of December 31, 2045, or the achievement of the Zero Emissions Clean Economy Target.

This Agreement shall not be amended, supplemented, or modified other than in a writing executed by both Parties and approved by the Court.

10. Dispute Resolution.

Unless otherwise expressly provided for in this Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Agreement. The Parties shall attempt to resolve any disagreements concerning this Agreement expeditiously and informally, pursuant to the following procedures:

a. A Party first must notify all other Parties in writing when a dispute or concern arises and request an opportunity to discuss the disputed issues or concerns; each Party agrees in good faith to make a concerted effort to resolve the dispute or concern through direct

negotiations without the need for judicial intervention or mediation;

b. If the Parties are unable to resolve the dispute within a two-week period of time, or longer upon agreement of the Parties, and upon written notice to all Parties, all Parties agree to select a mediator, or ask the court to appoint a mediator, and to notify the mediator and work cooperatively with the mediator to reach agreement; and

c. If no mutually agreeable resolution is reached within a 30-day period from the first mediation session, either Party may bring a motion in this Court under Case Number 1CCV-22-0000631 to enforce the Agreement.

Each side agrees to bear its own attorneys' fees and costs in connection with the dispute resolution process, including bringing a motion to enforce the Agreement.

11. Joint Press Conference.

On a mutually agreed upon date, HDOT, Defendant Sniffen, and Plaintiffs agree to hold a joint press conference at which a representative from the Office of Governor Green will be present, and the Parties agree to issue a joint press statement as the initial announcement of the successful resolution of this case by the Parties. The Parties agree not to disclose or speak to the media about the Agreement until such mutually agreed upon date.

12. Additional Terms.

a. The Parties recognize that HDOT's authority has limitations, and that HDOT cannot take any actions beyond the scope of the authority allocated to it under federal law and the laws and Constitution of the State of Hawai‘i. Nothing in this Agreement is intended to or does obligate HDOT to perform any task outside of the law or the scope of its authority or take any action that infringes on the legislature's authority. Nor does this Agreement impose on Defendants any obligations to expend funds in furtherance of any action beyond those funds that are appropriated by the legislature, or otherwise available to HDOT, and are legally available for such action. HDOT will make best efforts to secure funding from the legislature and the federal government, and make rule and policy changes as it deems necessary to meet the terms of this Agreement.

b. Other than Defendants' obligation to perform the specific actions in this Agreement by the deadlines set forth herein, nothing in this Agreement shall be construed to limit or modify any discretion accorded to Defendants under the Hawai‘i Constitution, Hawai‘i law, the Hawai‘i Administrative Procedure Act, or general principles of administrative law in taking the actions that are the subject of this Agreement.

13. Interpretation and Construction.

The Parties agree that this Agreement shall constitute a complete and final settlement of all claims in the Complaint, and all prior and contemporaneous negotiations and understandings between the Parties shall be deemed merged into this Agreement. The Parties treat this

Agreement as jointly drafted, and any rules of construction that construe any ambiguities against the drafting Party shall be inapplicable in any dispute concerning the interpretation of this Agreement.

14. Severability.

Each term and provision of this Agreement shall be considered severable and divisible from every other term and provision, and the invalidity or unenforceability of any one term or provision shall not limit the validity and enforceability, in whole or in part, of any other term or provision hereof.

15. Execution of Agreement.

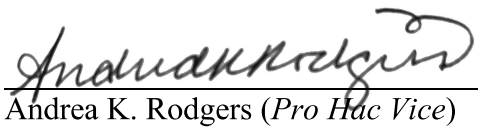
This Agreement may be executed in counterparts, and electronic or facsimile signatures will be treated the same as original signatures. It shall become effective on the date of the last execution. The attorneys signing below represent that they have reviewed the full Agreement with their clients, have obtained the express written consent of their clients under HRS § 605-7, and are authorized to execute this Agreement.

IN WITNESS WHEREOF, the Parties agree to the terms set forth herein as evidenced by the signature of their authorized representatives below.

ATTORNEYS FOR PLAINTIFFS

Date: May 16, 2024

Isaac H. Moriwake
Managing Attorney
Earthjustice



Date: May 15, 2024

Andrea K. Rodgers (*Pro Hac Vice*)
Deputy Director, U.S. Strategy
Our Children's Trust

ATTORNEY FOR DEFENDANTS

Anne E. Lopez

Date: May 16, 2024

Anne E. Lopez
Attorney General
State of Hawai‘i

SECOND AMENDED EXPERT DISCLOSURE REPORT

Michael Replogle

Principal, Replogle Consulting;
Founder, former Board President, and Senior Advisor of the Institute for Transportation and Development Policy;
Co-founder and former Board Chair of the Partnership on Sustainable Low Carbon Transport Foundation;
Former Deputy Commissioner for Policy of New York City Department of Transportation

Navahine F., a Minor, by and through her natural guardian, et al.
v.
Department of Transportation, State of Hawai'i, et. al.

Civil No. 1CCV-22-0000631

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ATTACHMENT B

TABLE OF CONTENTS

TABLE OF ACRONYMS

AASHTO:	American Association of State Highway and Transportation Officials
ADA:	Americans with Disabilities Act of 1990
ADB:	Asian Development Bank
CCICED:	China Council for International Cooperation and Economic Development
CIP:	Capital Improvement Program
CO DOT:	Colorado Department of Transportation
CRS:	Carbon Reduction Strategy
DBEDT:	Department of Business, Economic Development and Tourism
DOE:	United States Department of Energy
DOT:	Department of Transportation
EPA:	Environmental Protection Agency
EV:	Electric Vehicle
FHWA:	Federal Highways Administration
FTA:	Federal Transit Administration
GHG:	Greenhouse Gas
HCEI:	Hawai‘i Clean Energy Initiative
HDOH:	Hawai‘i Department of Health
HDOT:	Hawai‘i Department of Transportation
HOV:	High-Occupancy Vehicle
HSEO:	Hawai‘i State Energy Office
HSTP:	Hawai‘i Statewide Transportation Plan
ICCT:	International Council on Clean Transportation
IIJA:	Infrastructure Investment and Jobs Act
ITDP:	Institute for Transportation and Development Policy
IVHS:	Intelligent Vehicle Highway Systems
LiDAR:	Light Detection and Ranging
LOS:	Level of Service
LRTP:	Long-Range Transportation Plan
MDB:	Multilateral Development Bank
MN DOT:	Minnesota Department of Transportation
MODA:	Multi-Objective Decision Analysis
MPO:	Metropolitan Planning Organization
MRTP:	Mid-Range Transportation Plan
MSTRS:	Mobile Source Technical Review Subcommittee
NCHRP:	National Cooperative Highway Research Program
NEVI:	National Electric Vehicle Infrastructure

NHS:	National Highway System
NYC DOT:	New York City Department of Transportation
PPR	Project Programming Request
SLoCaT:	Sustainable Low Carbon Transport
SmartTRAC:	Smart Transportation Rank Choice
STAR:	Sustainable Transport Appraisal Rating
STIP:	Statewide Transportation Improvement Program
TIP:	Transportation Improvement Program
TRUE:	The Real Urban Emissions Initiative
VMT:	Vehicle Miles Traveled
ZET:	Zero Emission Target
WA DOT:	Washington Department of Transportation

1. EXECUTIVE SUMMARY

I, **Michael Replogle**, have been retained by counsel for the youth Plaintiffs to provide opinions and conclusions about the Hawai‘i State Department of Transportation’s (HDOT’s) plans, programs, and practices that have long exacerbated and, absent a fundamental and urgent shift in direction, will continue to exacerbate the high levels of greenhouse gas (GHG) emissions from the State of Hawai‘i’s (State’s) transportation system. As fully detailed below in the description of my qualifications, I have decades of experience in the transportation field, including an entire career of working with and within transportation agencies and expert organizations, and as a transportation agency administrator myself for the New York City Department of Transportation (NYC DOT).

Section A of my expert report explains how state Departments of Transportation (DOTs) like HDOT are in the driver’s seat for reducing GHG emissions from their state transportation systems. As the State’s head transportation agency, HDOT plays a leadership role in currently maintaining the high emissions from the status quo “legacy” transportation system, when it instead must play a leadership role in implementing a transformative shift in its organizational structure and culture, plans, programs, and practices to decarbonize the transportation sector and meet the State’s climate mitigation mandates. As has recently been reported:

> State governments play key roles when it comes to setting the pace (Bradbury et al., 2023) for reducing greenhouse gas (GHG) emissions from transportation—the largest source of climate pollution in the U.S. The investment decisions made at state and local levels directly affect levels of pollution from transportation, and those decisions will be an important factor determining the emissions outcomes (Georgetown Climate Center, 2021) of federal transportation policy. Investments in low-carbon transportation options, like public transit, electric vehicles, bike lanes, and pedestrian infrastructure, can accelerate progress toward meeting state and federal climate goals. On the other hand, spending transportation dollars on projects that expand roadway capacity tends to lead to additional driving (Volker and Handy, 2023), known as “induced travel,” which makes it more difficult to meet those critical goals.
>
> (Georgetown Climate Center, 2024).

This is not a recent realization. For more than a decade, federal-level agencies and expert authorities have emphasized the state DOTs' key role in reducing transportation sector emissions and have offered guidance and resources to state DOTs, including HDOT, to lead them forward, but HDOT has instead continued its business-as-usual path.

Section B shows how HDOT, in performing its foundational responsibilities of planning the State's transportation system and programming the State's transportation infrastructure investments, perpetuates the status quo GHG-intensive transportation system. In particular, even though all state DOTs, including HDOT, operate under a performance-based framework that includes goals, objectives, targets, metrics, and organizational structures and protocols for performance, HDOT does not have performance measures for reducing GHG emissions from the transportation sector. HDOT has no comprehensive transportation decarbonization plan, and its existing transportation system planning instead continues the status quo of increasing GHG emissions. HDOT's programming function for funding its transportation projects and programs also perpetuates this status quo by disregarding GHG reduction as a prioritization criterion and performance metric.

Section C establishes how HDOT's systemic practices prioritize programs and projects that increase GHG emissions. HDOT's project prioritization criteria and performance metrics explicitly favor projects that increase GHG emissions over transportation alternatives that decrease emissions. Conversely, HDOT does not track and report its performance on reducing GHG and vehicle miles traveled (VMT). (**Subsection 1**). It has not established any objectives, targets, or plans for the recognized strategies for decarbonization, particularly the mass electrification of transportation and the building of the statewide electric vehicle (EV) charging infrastructure. (**Subsection 2**).

Instead of advancing decarbonization, HDOT continues its system of prioritizing traditional vehicle-capacity-expansion projects, which exacerbates the ongoing trend of increasing VMT and the resulting GHG emissions. (**Subsection 3**). HDOT has long been informed and directed to reduce VMT, yet has disregarded this responsibility. (**Subsection 4**).

In the absence of any HDOT reporting on the VMT and GHG impacts of its transportation infrastructure program, I conducted an independent evaluation of HDOT's highway capital improvement budgets over the last 11 years. My analysis indicates that HDOT has directed most funds toward projects that increase VMT (33%) or have no impact on VMT (61%), and only a minimal

remaining share toward projects that reduce VMT or GHG emissions (4% total). This shows that the State's engine of transportation infrastructure spending continues to drive toward ever-increasing VMT and GHG emissions. (**Subsection 5**).

Section D documents how HDOT's plans, investments, and actions for "multimodal" options (i.e., the full range of transportation modes including low-carbon alternatives and "active" mobility though human exercise) limit the public's transportation choices, keep people in their cars, perpetuate a car-centric system, and increase emissions. HDOT has left the statewide pedestrian infrastructure vastly unfunded, undeveloped, and unsafe for decades. It has also deprioritized the statewide bicycle infrastructure for decades and will leave this network vastly incomplete. It has idly sat by during the extreme collapse in public transit ridership over the past decade across the state. And it fundamentally undermines Hawai'i's "Complete Streets" mandate, which requires HDOT to design and build roads for all transportation modes by all people of all ages and abilities.

Section E explains that the handful of activities—largely limited to HDOT's internal vehicle fleet, facilities, and operations—that HDOT has raised as examples of its "initiatives" to reduce GHG emissions, simply underscore the fundamental defect in HDOT's approach to transportation decarbonization. In short, HDOT remains focused on its ad hoc, piecemeal measures at the margins, rather than systems-level transformation at the scale and pace necessary to meet the State's declared "climate emergency" and established decarbonization mandates. So long as HDOT treats GHG mitigation as an ancillary, discretionary consideration limited to the agency's internal activities, rather than establishing it as a core part of its governmental mission, HDOT and the State will remain off track from the direction necessary to decarbonize the transportation sector.

I conclude that HDOT's planning, implementation, and management of the state transportation system is perpetuating the legacy of dependence on fossil fuels and is thereby escalating climate pollution and harms to the youth Plaintiffs. Hawai'i's current transportation system, which is almost exclusively powered by fossil fuels, is not an inevitable consequence of history, but a direct result of decisions and actions taken by Defendants that are continuing today. The mandated decarbonization of the transportation sector will not happen without HDOT's and the State's active leadership to rapidly transform its legacy transportation system and practices to achieve a clean, decarbonized transportation network of the 21st century. Yet, based on my review of all the information discussed below and my professional experience working with and

within DOT organizations, it is my opinion that HDOT remains fundamentally misaligned as an institution with fulfilling the State's comprehensive decarbonization vision and mandates; moreover, this condition shows no foreseeable prospect of changing any time soon without some form of intervention.

2. BACKGROUND AND QUALIFICATIONS

I am a transportation engineer and an experienced government transportation executive and policy specialist with decades of knowledge and expertise in the transportation field. I currently serve as the principal of Replogle Consulting, an independent consultancy offering services for both the public and private sectors related to transportation policy, strategy, implementation, and impact assessment.

From 2015 to 2021, I served as Deputy Commissioner for Policy of NYC DOT, where I was responsible for developing and implementing long-term agency strategy, guiding a workforce of more than 5,000 staff, a $1.1 billion annual operating budget, and a $33 billion 10-year capital program. NYC DOT manages 6,300 miles of roadways, 12,000 miles of sidewalks, 800 bridges, and the Staten Island Ferry. I produced the agency's *Strategic Plan 2016: Safe, Green, Smart, Equitable,* and the transportation element of the *New York City's Roadmap to 80x50*, a plan to achieve an 80% reduction in GHGs by 2050 and to increase the combined share of trips by walking, cycling, and public transport from 65% to 80% by 2050. Those planning elements, while aimed at 80% reductions based on a now-dated 2016 directive, are similar to and consistent with goals to fully decarbonize transportation sectors as Hawai‘i requires by 2045.

I managed many successful NYC DOT initiatives designed to reduce GHGs and improve traffic safety. I advanced wider deployment of bus priority treatment, with more than 50 miles of new bus lanes, including the path-breaking 14th Street busway, which accommodates trucks and drop-offs while accelerating bus travel times. I received the International Transport Forum's Global Award for our Vision Zero policies which cut traffic deaths by 25% and pedestrian deaths by 40% in 4 years while expanding use of walking and cycling. My design of New York's Open Restaurants program proved popular and in a matter of weeks turned 10,000 parking spaces into outdoor cafes, saving 100,000 jobs during Covid. I helped secure 500 additional protected bike-lane-miles and 100 miles of Open Streets. I oversaw and shaped the expansion of CitiBike to 40,000 shared bicycles, from 6,000 when I started, as well as the introduction of electric bikes

into the bikesharing fleet, working through an innovative public-private partnership. I developed *Electrifying New York: An Electric Vehicle Vision Plan for New York City* (NYC DOT, 2021a), as well as successful pilot programs for EV charging which are now being taken to scale.

Under my management, the agency launched several other pilot programs which have now been enlarged and made into permanent programs, including car, scooter, and dockless bike-sharing, off-hours delivery incentives, e-cargo bike deliveries, and e-truck loading zones. I modernized the agency's asset management and project prioritization budgeting systems. I advised the New York Metropolitan Transportation Council and New York City agencies on how to improve GHG inventories and appraisal methods for transportation. I also worked closely with sister agencies, including the Metropolitan Transportation Authority and Port Authority of New York New Jersey, shaping congestion pricing, camera-based traffic law enforcement, climate adaptation, and air quality policy, as well as consideration of multi-billion-dollar mega-projects, such as the Port Authority Bus Terminal, Gateway Tunnel, and coastal resilience initiatives. I shaped the City's federal transportation policy and grant application preparations, inclusive transport, and intelligent transportation.

I have been appointed to serve on numerous federal advisory committees on transportation issues. In 2023, I was reappointed to a second three-year term on the U.S. Environmental Protection Agency (EPA) Mobile Source Technical Review Subcommittee (MSTRS), part of the Federal Clean Air Act Advisory Committee. Through MSTRS quarterly meetings, I advise EPA's Office of Transportation and Air Quality and Office of Policy. I have also served appointments as a member of: (1) the Federal Travel Model Improvement Program Advisory Panel, a joint advisory committee giving guidance to the U.S. Department of Transportation, Department of Energy (DOE), and EPA in their research, development, and training programs related to transportation, land use, and emission computer modeling; (2) the EPA MOVES Review Work Group, offering guidance on development of EPA computer models used for transportation emissions analysis; (3) the U.S. DOT Advisory Committee on Transportation Statistics; (4) the U.S. DOT Intelligent Vehicle Highway Systems (IVHS) Architecture Advisory Panel; (5) the EPA Freight, Economy, and Environment Working Group; and (6) the Transportation Research Board (National Academies) Task Force on the Effects of Added Highway Capacity on Energy and the Environment. I was a Liaison to the Energy and Transportation Task Force of the President's Council for Sustainable Development, developing scenarios and recommendations for the White House.

I have also led and advised non-governmental expert organizations on transportation. I am a member of the Advisory Committee of The Real Urban Emissions Initiative (TRUE), a partnership of the FIA Foundation and the International Council on Clean Transportation (ICCT) with a shared interest in cleaning up vehicles and improving urban air quality. In 2010, I co-founded the Partnership on Sustainable Low Carbon Transport (SLoCaT), which brings together multilateral development banks (MDBs), United Nations agencies, non-governmental organizations, industry associations, and others to advance climate and sustainable development goals. Under my leadership, as Chair of the SLoCaT Board of Directors from 2012-16, we secured and monitored implementation of a $185 billion 10-year commitment from the eight largest MDBs to more sustainable transport.

I founded the Institute for Transportation and Development Policy (ITDP) in 1985 and over the years have served as its Board President, Managing Director for Policy, and currently as Senior Advisor and Director Emeritus. In my ITDP work, I have advised many senior national, state, provincial, and city government officials in the U.S., Canada, Europe, China, Mexico, Indonesia, and Brazil, particularly on strategies to plan and evaluate projects, policies, and programs for their GHG, air quality, equity, and economic benefits and costs. I helped the organization become a catalytic player in advancing bus rapid transit, bike-sharing systems, traffic safety, compact transit-oriented development initiatives, better transport project and program appraisal, and other policy reforms in dozens of countries worldwide.

I also served as Transportation Director for the Environmental Defense Fund from 1991-2008, shaping transportation and environmental laws and advising governments on city planning, transport management and finance, and air quality/environmental analysis, working in dozens of cities across the U.S. and the world. I advised US DOT, EPA, and many state DOTs and Metropolitan Planning Organizations (MPOs) about transportation strategies to protect public health by reducing air pollution and GHGs. I was especially involved in transportation and air quality planning processes in many metropolitan areas in this country and in Mexico, including helping to redirect transportation spending from road expansion to transit, traffic safety, road maintenance, walking, and cycling.

I was an architect of and leading member of the Steering Committee for *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions* (Cambridge Systematics, Inc., 2009), a study supported by the Federal Highway Administration, Federal Transit

Administration, EPA, and industry and non-governmental organizations. The analysis was later turned into a report to the U.S. Congress. The work estimated the degree to which the U.S. could cut GHG emissions through 50 different policies and strategies. I also developed the ITDP report, *A Global High Shift Scenario: Impacts and Potential for More Public Transport, Walking, and Cycling with Lower Car Use* (Replogle, 2014), which evaluated GHG reductions, costs, and benefits of plausible shifts in investments across the world and laid the foundation for follow-up studies, including most recently the *Compact Cities Electrified* (ITDP, 2023) series, which investigates national, state, and regional opportunities for GHG mitigation and co-benefits for equity and economic development.

My work over the years has included advising international-level organizations. As a consultant to the Asian Development Bank (ADB), I evaluated the carbon footprint of its transport projects and programs over the preceding decade and developed the Sustainable Transport Appraisal Rating (STAR) Tool,[1] an app for evaluating prospective projects and programs at ADB. These achievements shaped ADB's sustainable transport initiatives, for which I was named the ADB Partner of the Year in 2015. As a consultant and advisor to the Global Environmental Facility, a worldwide multilateral environmental fund including 186 member countries, I developed the *Manual for Calculating Greenhouse Gas Benefits of Global Environment Facility Transportation Projects* (Hook et al., 2022), and the related *Transportation Emissions Evaluation Models for Projects* (ITDP, 2015). These tools are widely used across the world.

In 2013, I was appointed Visiting Professor at the China Academy of Transportation Sciences in Beijing after several years advising the Beijing City Government on transportation and encouraging them to adopt parking and car-use management reforms. A joint European Union-Government of China organization, the China Council for International Cooperation and Economic Development (CCICED), appointed me to a panel which produced a CCICED report, *Promoting Urban Green Travel* (CCICED, 2013), which was presented to the China State Council in 2014 and helped shape national transportation policy to foster GHG reduction. Many of the recommendations were adopted as national policy.

I hold honors undergraduate civil engineering and sociology degrees and an MSE in civil and urban engineering from the University of Pennsylvania. In 2021, I held a faculty appointment at New York University's Wagner School of

[1] https://tpassess.adb.org/index.html

Public Service. A more detailed summary of my qualifications, including my publications, is contained in my curriculum vitae, **Attachment 1**.

The opinions set forth in this report are my own and not the opinions of any of the institutions with which I am otherwise affiliated. My opinions are based on my education and experience and the data and facts available to me at the time of writing, as referenced in this report. Should additional relevant or pertinent information become available to me, I reserve the right to supplement the discussion and findings in this report. I have not provided expert opinion testimony in any cases during the previous three years.

In preparing this report, I reviewed a number of documents, data, and studies in forming my opinions and conclusions in this case, all of which are identified in **Attachment 2**. My findings are also based on my experience as a transportation policy expert and consulting with other transportation policy experts who have similar expertise in transportation policy and decarbonization of transportation systems. It is common practice in my field to confer with others who are engaged in similar types of work. The methodology I used in evaluating HDOT's funding priorities is set forth in **Attachment 3**. The legal authority that I reviewed in preparing this report are included in **Attachment 4**.

I have received $10,000 in compensation for consulting services to inform the discovery process and any settlement discussions. I have prepared my expert report and will testify at trial on a *pro bono* basis, given the financial circumstances of these young Plaintiffs and the urgent need for the judiciary to understand the mechanisms to decarbonize the transportation system to address the climate emergency that is harming these youth Plaintiffs.

3. EXPERT OPINIONS

A. The Hawai‘i Department of Transportation Must Play a Lead Role to Reduce Greenhouse Gas Emissions from the Statewide Transportation System.

State DOTs are the lead agencies responsible for funding, planning, building, and operating the transportation systems in each state. The state DOTs in each state, including HDOT in Hawai‘i, led the creation of their legacy state

transportation systems, and they will also need to lead the creation of the clean, decarbonized transportation systems of the future.

The State of Hawai‘i has committed to net negative emissions by 2045 and a 50 percent reduction by 2030 (HRS § 225P-5), including the specific goal of "decarbonizing the transportation sector" (HRS § 225P-7). For the State to meet this important goal, HDOT must take an active lead role in decarbonizing the transportation sector, as part of a whole-of-government commitment across all sectors. Conversely, the State cannot realistically hope to achieve its decarbonization goals unless HDOT is fully aligned with achieving these goals both internally throughout its organization and externally with the whole state government.

For more than a decade, federal-level agencies and expert authorities have emphasized the key role of state DOTs in reducing transportation sector GHG emissions. These agencies and organizations have offered guidance and resources to state DOTs, including HDOT, to assist them in fulfilling this responsibility. HDOT has been aware and informed of this need to shift its planning and operations, but it still has not taken even the first recommended steps to begin the transformative changes necessary within its organization and throughout the state transportation system and, instead, continues to build infrastructure to support the legacy fossil fuel system.

1. *Background on HDOT's Lead Role and Responsibility in Planning and Building the Statewide Transportation System*

Hawai‘i, like other states, has established its DOT as one of the "principal departments" in the state government structure. (HRS § 26-4). As its statutory mission, HDOT "shall establish, maintain, and operate transportation facilities of the State, including highways, airports, harbors, and such other transportation facilities and activities as may be authorized by law." (HRS § 26-19).

The governance structure and process for the transportation system is similar in each state. As a foundational responsibility, state DOTs make transportation system investment decisions directing the flow of public infrastructure funding for the statewide transportation system.

Transportation infrastructure investments comprise a major share of every state's annual capital improvement program (CIP) budget. HDOT's budget share is included in the Governor's proposed budget for the administration, which is

ultimately approved by the Legislature. In Hawai‘i, for example, the transportation CIP budget has averaged around $700M per year over the past decade, comprising about half of the state’s total CIP budget. In FY 2024, the transportation CIP budget is more than a billion dollars ($1,165,238,000), around 55% of the total state CIP budget of $2.11B. (State of Hawai‘i, 2022).

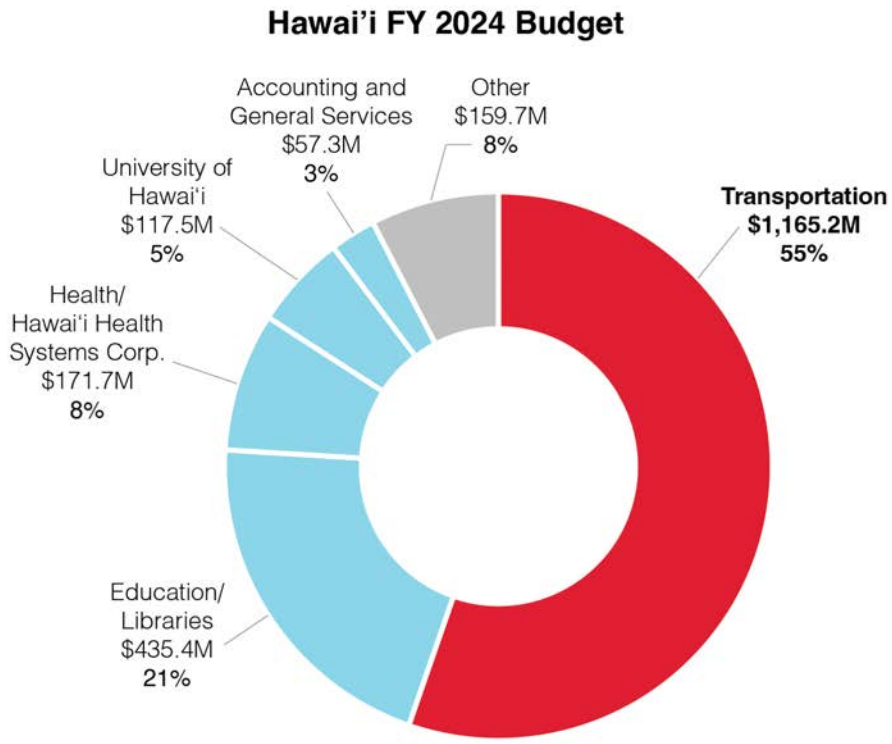

Figure 1. Source: (State of Hawai‘i, 2022a).

Transportation Planning

Planning is at the heart of the state DOT’s administration of the transportation infrastructure system. In their oversight role, state DOTs maintain and coordinate a network of plans spanning a range of time horizons and transportation modes.

At the highest level, the state DOT must provide a **statewide transportation plan** establishing the State’s strategic vision and direction for its overall transportation system investments over a period of at least 20 years. Hawai‘i has established this statewide planning requirement in state statute. HRS § 279A-1 mandates a “comprehensive, multi-modal statewide transportation

planning process." The coordination of the plan is "the primary responsibility of the department of transportation."

In Hawai‘i, the Legislature has mandated that the statewide transportation plan "shall be directed toward the ultimate development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic, and environmental objectives" and shall include national and state highways, airports, harbors, surface mass transit, and major county roads. (HRS § 279A-2(a)). The plan shall "[i]nclude projected transportation needs for a six-year period and a schedule of priorities" for investments over a 20-year period. (HRS § 279A-2(b)(1)). HDOT must update this information annually. (HRS § 279A-2(c)).

Based on this mandate, HDOT has produced the Hawai‘i Statewide Transportation Plan (HSTP). Currently, a draft version of HDOT's *Hawai‘i Statewide Transportation Plan 2045* dated November 2022 is posted on HDOT's website. (HDOT, 2022a). The prior HSTP is dated 2011. (HDOT, 2011). HDOT describes the HSTP as "the overarching policy document that guides the system-level and master plans of the three primary modes of transportation." (HDOT, 2022a, 2022b).

State DOTs are also required by federal law to develop a "long-range statewide transportation plan" covering at least a 20-year period. (49 U.S.C. § 5304(f)). In Hawai‘i, the current long-range plan for ground transportation is the *Statewide Federal-Aid Highway 2035 Transportation Plan.* (HDOT, 2014). This 2014 long-range transportation plan (LRTP) "addresses future land transportation needs for freight, motorists, transit, bicyclists, and pedestrians" through 2035. HDOT is currently working on an update to this plan (Tatsuguchi Tr. 31:22-23), but no draft has been released to the public, and it is unknown when the update will be complete.

Transportation Program Investments

Building on the long-range plans, state DOTs also must conduct a "programming" function of developing a **statewide transportation improvement program** (STIP) that covers a period of four years and must be updated every four years. (49 U.S.C. § 5304(g)). The STIP designates the state's priority list of transportation projects intended to be funded during that period. The STIP includes all projects in the state that receive federal funding support. The STIP must be "fiscally constrained," meaning that it is not an open wish list,

but rather reflects select priority projects that can be implemented with total available revenue sources.

In essence, the STIP is the short-term budget and action agenda that implements the LRTP. The STIP thus must be consistent with the LRTP and advance the goals and strategies presented in the LRTP. In Hawai‘i, the most recent STIP is the FY 2022-2025 (+2) STIP approved on November 23, 2021 (HDOT, 2021a), and most recently approved as amended on September 12, 2023 (HDOT, 2023a).

Through this planning and programming process, the Federal Highways Administration (FHWA) and the Federal Transit Administration (FTA) of the U.S. DOT provide funding to state DOTs to build, maintain, and improve the state surface transportation systems. These federal funds comprise a substantial portion of state transportation budgets. In Hawai‘i, for example, my review of the historical data for the last decade (further discussed in section C.5 below) indicates that federal funds comprise a little over half (~51%) of the State's transportation CIP budgets.

As the lead administering agencies for each state, the DOTs have broad discretion and flexibility in deciding how to spend the federal transportation funds for state, regional, and local projects. Most federal transportation funding is distributed through formula grant programs that allocate funds under designated formulas in the law considering population, road mileage, and other factors. Such formula funding allows state DOTs to use the funds for a wide range of transportation investments—including plans, strategies, and projects to reduce GHG emissions. (Georgetown Climate Center, 2023). The federal government also provides competitive discretionary grant programs tied to specific purposes, including measures to reduce GHG emissions, which states can apply for and be awarded based on merit.

The primary responsibility of state DOTs for spending and directing the flow of federal transportation funding has never been more significant than at this moment in history. The comprehensive federal Infrastructure Investment and Jobs Act (IIJA) passed in 2021 (also known as the Bipartisan Infrastructure Law), dedicates record amounts of transportation infrastructure funding over five years through these channels. The IIJA authorizes more than $1.2 trillion in infrastructure spending, mostly for transportation, which is the largest federal transportation funding authorization in history. (U.S. DOT, [BIL/IIJA]; U.S. DOT, [BIL]). The state DOTs are on the frontlines for the nation in deciding how these funds will be spent. (AASHTO, 2021; Georgetown Climate Center, 2023).

HDOT's decisions today and in the next several years will chart the future for the state's transportation systems for decades to come.

In their lead role, state DOTs combine these federal funds with state government funds to produce an overall state transportation capital improvement program (CIP) and budget. In Hawai‘i, HDOT develops its annual CIP budget for statewide transportation infrastructure investments, which the Governor includes in the administration's proposed budget and the Legislature approves. The CIP budget includes the federally funded projects in the STIP, as well as projects funded solely by the state.

DOTs also work with Metropolitan Planning Organizations (MPOs), which are local and regional policy boards that provide recommendations in the transportation planning process. Federal law requires MPOs to be established in areas with populations over 50,000. MPOs are also required to develop a long-range plan and a transportation improvement program (TIP), similar to the statewide plan and program. The TIP is incorporated into the STIP. The State of Hawai‘i has designated MPOs on the islands of O‘ahu and Maui. (HRS §§ 279D-1 to -11). While MPOs are a federal requirement, they function as local governance entities and are established under Hawai‘i state law and through cooperative agreements between the state and county governments.[2]

In sum, the state DOTs function as the control hubs for planning, budgeting, spending, and allocating the enormous, continuous pipeline of government funding for the transportation infrastructure system. They orchestrate the flow of the billions of dollars of transportation funding based on their governing vision, goals, and priorities for the system. In addition to their fundamental responsibility to establish the statewide transportation infrastructure plan and program, state DOTs have comprehensive responsibilities to manage, operate, and coordinate the state transportation system that they build.

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[2] State DOTs institutionally play a dominant role in the MPO process. Thus, "State DOTs can strongly influence TIP development to consider GHG emission reduction through their guidance to the MPOs in their State." (NCHRP, 2022a). State DOT officials serve as members and advisors of the MPOs. DOTs also provide guidance and administrative and technical support to the MPO, and their institutional background and leverage over the funding flows give them an outsized influence in the MPO process. In Hawai‘i, HDOT provides broad administrative and technical support to the MPOs, and it commands more extensive personnel and budget resources than its regional and local partners. Further, most of the MPO board members are political appointees including elected and sister agency officials, whereas HDOT members of the MPO board and technical advisory committee are full-time employees in the transportation field.

2. *HDOT Has Impeded Achieving Reductions in GHG Emissions from the Statewide Transportation System.*

As the federal government has emphasized, **state DOTs play a "key role in implementing activities to reduce transportation-related greenhouse gas emissions, including on-road emissions."** (U.S. GAO, 2023). The FHWA highlights the "essential role" of state DOTs in "implementing policies, programs, and projects that can reduce GHG emissions." "By incorporating greenhouse gas (GHG) analysis into transportation planning, agencies can act now to help decrease future emissions." Such action "can lead to better transportation program and project decisions" and is a "critical step" toward meeting GHG reduction goals. (U.S. DOT, Integrating GHG Assessment).

In my opinion, basic planning to achieve the GHG emissions required by law is the essential first step for HDOT; but in my review of HDOT's practices, programs, and projects, as well as its own statements, HDOT is not planning for how each of its actions and its statewide transportation system can and will reduce GHG emissions. Instead, HDOT continues to plan for perpetuating the legacy fossil-fuel-dependent transportation system for decades. As just one prime example, HDOT's draft HSTP analyzes five "alternative futures," including a "business as usual" future with continuation of a fossil fuel transportation system. This should not be an option for consideration in Hawai‘i, even as an "alternative," because decarbonization of transportation is a legal requirement. (HDOT, 2022b). Even more importantly, the HSTP doesn't identify and adopt strategies for timely and comprehensive decarbonization of transportation through substantial mode shifting, VMT reduction, and much more rapid electrification of light-duty, medium-duty, and heavy-duty vehicles.

For decades, the federal government and associated transportation organizations have been publishing resources to guide DOTs with strategies to decarbonize the transportation sector. For example, the FHWA has offered state DOTs extensive resources to "address GHGs in the planning process based on vetted, state-of-the-practice examples." These resources include "specific analytic tools, methods, and frameworks to support target setting and GHG estimation that can be integrated with existing planning products," such as the statewide transportation plans and programs. "Currently available tools and best practices related to GHG analysis and target setting will allow all agencies, regardless of technical capacity or size, to take steps toward integrating the consideration of GHG emissions into existing planning structures." State DOTs can "align GHG reduction goals with strategies to meet targets and make progress," by "considering GHG emissions at every step in the transportation

planning and decision-making process." (U.S. DOT, Integrating GHG Assessment).

Figure 2. Source: (U.S. DOT, Integrating GHG Assessment).

Below are a handful of examples, dating back more than 15 years, of GHG reduction resources and opportunities that HDOT should have, but has not, implemented in the transportation sector:

- In **2006**, the National Cooperative Highway Research Program (NCHRP) issued *Assessment of Greenhouse Gas Analysis Techniques for Transportation Projects*, which was requested by the American Association of State Highway and Transportation Officials (AASHTO) and "provide[d] practical information to help transportation practitioners better understand the available [GHG] analysis techniques for transportation analysis." (ICF, 2006).
- In **2009**, the NCHRP, again at AASHTO's request, issued Strategies for Reducing the Impacts of Surface Transportation on Global Climate Change: A Synthesis of Policy Research and State and Local Mitigation Strategies, advising that "[c]limate change is likely to have more impact on the future of surface transportation than any other issue" and flagging the state DOTs "need to support major GHG reductions." It reviewed strategies and scenarios for GHG reduction and identified several state DOTs (CA, NY, OR) taking the initiative to address GHG "in the planning, implementation, and operation of their transportation networks." (Burbank, 2009).

- In **2012**, the National Academies of Sciences published *Incorporating Greenhouse Gas Emissions into the Collaborative Decision-Making Process*, as well as the accompanying *Practitioner's Guide* for state transportation agencies "involved in transportation planning and decision making who wish to consider GHG emissions in a systematic and thoughtful manner." The report recognized "these agencies will be heavily involved in efforts to mitigate GHG emissions from surface transportation sources," and "[s]uccessful strategies and plans will result from incorporating GHG emissions into their transportation planning and decision making"; and the guide provided a framework for GHG analysis and strategies for GHG mitigation. (NAS, 2012).
- In **2013**, the FHWA issued *A Performance Based Approach to Addressing Greenhouse Gas Emissions through Transportation Planning*, a "resource for State DOTs and MPOs interested in addressing GHG emissions through performance-based planning and programming" to "support investment choices and enhance decision-making." The handbook explained the various steps for integrating GHG analysis into state transportation planning, including: identifying performance measures; setting targets; analyzing strategies, developing plans and programs, and prioritizing projects; and monitoring and reporting on progress. (Grant et al., 2013a).
- Also in **2013**, the FHWA issued its *Handbook for Estimating Transportation Greenhouse Gases for Integration into the Planning Process*, "intended to help state DOTs and MPOs of all sizes and capabilities understand possible approaches, data sources, and step-by-step procedures for analyzing GHG emissions for use in the transportation planning process." It provided a "practical resource for state DOT and MPO staff" to implement and integrate such GHG analysis in transportation system planning. (Grant et al., 2013b).

Many of these resources from a decade or more ago cited examples of state DOTs and MPOs that were implementing recommended actions at that time. Hawai‘i was not among the states mentioned, and its transportation sector has been called out for "lagging behind" other sectors. (HCEI, 2011; HCEI, 2015).

A stark example of HDOT's perpetuation of its business-as-usual conduct occurred when the NCHRP—which is a joint national-level program between state transportation officials, the FHWA, and the National Academy of Sciences—developed a guide entitled *Reducing Greenhouse Gas Emissions: A Guide for State DOTs* ("*State DOT Guide*" or "*Guide*"), (NCHRP, 2022a), and an

accompanying report entitled *Methods for State DOTs to Reduce Greenhouse Gas Emissions from the Transportation Sector* ("*Report*"), (NCHRP, 2022b).

The *State DOT Guide* "presents methods for State [DOTs] to reduce [GHG] emissions from the transportation sector." **The *Guide*'s expressed purpose includes enabling state DOTs "to assess GHG emissions, evaluate GHG reduction opportunities, and develop action plans," and "understand how they can address GHGs through all stages of their activities."** It focuses less on "technical resources (data and computational tools)," which are already reasonably available—and more on "institutional procedures and practices," to "direct a State DOT on how to integrate GHG considerations across its spectrum of activities." (NCHRP 2022b).

Based on my review of the *Guide*, it provides a comprehensive and definitive resource on the best practices for implementing the necessary institutional changes in state DOTs to meet GHG reduction goals and decarbonize the transportation sector. HDOT, however, continues its status quo transportation practices that produce rising GHG emissions.

As the *Guide* and *Report* make clear, **"[g]iven the substantial contribution of the transportation sector to emissions, the State DOT should play a lead role in a State's GHG reduction effort."** (NCHRP, 2022a) (emphasis added). Further, the entire DOT organization internally "must be coordinated to address GHGs":

- "First and foremost, strong direction from leadership is required for a concerted and sustained effort."
- Further, "if anything is going to be done to address any overarching issue within a DOT context, some organizational unit with motivated staff must lead and still others must deliver in cooperation with other parts of the agency."
- Beyond this leadership structure, however, "[c]omplex operations like GHG reduction require many organizational units to operate in a concerted manner, and each must be trained, equipped, and directed to play its role within the constraints of competing priorities and available resources." (NCHRP, 2022b).

Based on my institutional experience with transportation agencies and organizations, I am familiar with these principles and am also familiar with the term "**community of practice**" to describe comprehensive organizational

alignment with a priority goal. It starts with leadership, but is ultimately owned by everyone in the organization, at the level of organizational identity and culture. Nothing less is required for a state DOT like HDOT to meet the pace necessary to decarbonize its state transportation system.

HDOT has no such organizational framework for decarbonizing the state transportation system. Instead, HDOT has sought to hire an outside consultant to do the work to develop carbon reduction and quantification methods. HDOT identified the need for this work "over a year ago," in response to minimum conditions for federal transportation funding. (Tatsuguchi Tr. 42:12-18). Yet, as of late 2023, the consultant still had not been hired, no work had begun, and HDOT did not have a sense of when the work would be completed. (HDOT Tr. 70:15-71:18).[3] Further, relegating work as important as transportation sector decarbonization to external consultants, without establishing dedicated internal organization and personnel structures, is not a signal of commitment or a formula for progress in any organization, especially a large and multi-layered organization like a state DOT.

HDOT, in fact, has been aware of and involved in this *State DOT Guide* project over the course of the past five years. As part of this project, NCHRP sent surveys to the state DOTs in the fall of 2018 to identify their levels of engagement in addressing GHG emissions. (NCHRP, 2022b). Earlier that year, the Hawai‘i Legislature had established the Zero Emissions Target in HRS § 225P-5.

[3] "HDOT Tr." refers to the deposition transcript of HDOT's designated 30(b)(6) witness in this case, HDOT Director Edwin Sniffen.

HDOT's responses to the survey included:

NCHRP Survey Responses

Survey Question	HDOT Response
Does your agency have a policy or policies related to GHG emissions reduction?	**No**
Has your agency developed an inventory of GHG emissions (carbon footprint) for its own operations?	For Honolulu International Airport only
Has your agency developed a transportation-sector GHG inventory and/or forecast for the State, or worked with a partner agency to develop one?	For Honolulu International Airport
Has your agency established long-range transportation plan (LRTP) goals, objectives, and/or performance measures related to GHGs?	**No**
Does your agency consider GHG impacts in transportation improvement program (TIP), State TIP, and/or other capital programming evaluation?	**No**
Does your agency consider GHG impacts in project development and alternatives analysis?	**No**
Does your agency externally communicate progress regarding plans or projects which contribute to achieving GHG targets or goals?	**No**
What GHG assessment tools or methods (if any) have been applied by your agency?	**None**
How adequate are existing resources for supporting your agency's current and expected consideration of GHG issues?	Need better analytical tools (or information about tools). Need technically knowledgeable staff.
Would your agency be interested in participating in additional activities of this research project, including workshops to develop and review GHG resources, and/or implementation support of GHG analysis methods?	**Possibly interested**

Table 1. Source: (Appendix A in NCHRP, 2022b).

All of HDOT's answers confirm its actions to continue the fossil fuel transportation system instead of shifting to the philosophy of GHG reduction.

The NCHRP also convened individual workshops with a select handful of DOTs to test and implement the Guide. HDOT was one of four state DOTs with whom NCHRP arranged such a workshop. The Hawai‘i workshop was held virtually in January 2021. It included HDOT staff, as well as representatives from other state agencies, county governments, and MPOs. (NCHRP, 2022b).

In its summary of the Hawai‘i workshop, the *Report* related, “HDOT anticipates that, without concerted action, the percent of net emissions in Hawai‘i attributed to the transportation sector will only continue to rise” (emphasis added). The workshop participants generally rated HDOT’s GHG engagement as Level 2 out of 4: “having taken some actions, but still with much more that could be done.”[4] (NCHRP, 2022b).

HDOT anticipates that, without concerted action, the percent of net emissions in Hawai‘i attributed to the transportation sector will only continue to rise.

In a workshop poll, over half of the Hawai‘i participants expressed that the *Guide* would be only “somewhat” useful, in comparison to about a third who felt it would be “very” useful. The *Report* surmised that this response “may be due to the relatively low portion of participants from HDOT compared to counties/cities, MPOs, and other agencies, who are not the primary audience of the guide.” Further highlighting HDOT’s business-as-usual mindset, the workshops also included an opportunity for additional post-workshop technical assistance, but requests for such assistance “were more limited than anticipated”: “None of the agencies requested specific follow-up assistance with technical items (data, analysis, etc.).” (NCHRP, 2022b).

Proposed next steps for action were provided to HDOT staff for review, and are reproduced from the *Report* in Table 2 below. Based on my review of available information, since this workshop **three years ago**, HDOT has done little or nothing to follow up on these steps to reduce GHG emissions within the transportation sector and change its current operations from the status quo:

[4] For reference, Level 1 is “new to the topic,” Level 3 is “measuring and planning our actions and engaging others,” and Level 4 is “taking action and tracking progress internally and with partners.”

2021 NCHRP Workshop HDOT Next Steps

Action/Responsibility:	Timeframe	As of 2024…
Action 1: Create an executive charter that establishes a task force or working group that meets regularly (e.g., monthly) to identify action items and report on progress. This group should be charged with investigating, assessing, reporting on, and implementing GHG emission reduction measures for all direct and indirect DOT-related GHG emissions. This group should include key staff representing all of the agency's divisions/functional areas. **Responsibility:** Executive Leadership.	One month	Although the suggested one-month timeframe for implementation has long expired, HDOT admitted it has **NOT** taken the first action of instituting an executive charter and management group to address GHG reduction. (HDOT Tr. 83:1-16).
Action 2: Functional area leads should work with their staff to complete the self-assessment(s) included at the end of their area's relevant section(s) of the guide. Share recommended actions with GHG task force; get executive buy-in where needed; and set a process/timeline for checking in on progress. **Responsibility:** Functional area leads included in GHG task force.	Two months	HDOT has **NOT** conducted any of the self-assessments to inform and implement necessary action steps and assign responsibilities. (Defs' Resp. to Req. for Prod. No. 89).
Action 3: Continue working with the Statewide Climate Coordinator and other agencies to develop a roadmap for the State to achieve the State's goal of a zero-carbon economy by 2045. To the extent it is not being done already, representatives(s) of HDOT should meet regularly with the Statewide Climate Commission and other agencies to communicate what HDOT is doing and can do to estimate and reduce GHGs from the transportation sector. Identify how HDOT and other State agencies can work together and support each other to get to the 2045 goal. **Responsibility:** Statewide Climate Commission and HDOT climate or other designated lead per task force.	Ongoing	HDOT has **NOT** taken action to estimate and reduce GHG from the transportation sector, much less to communicate and coordinate its work with other agencies. As of late 2023, HDOT has **NO** plans to inventory emissions and will **NOT** do so until it receives feedback from the Hawai'i State Energy Office (HDOT Tr. 81:1-16), but HDOT would **NOT** consider any recommendations received from the Hawai'i State Energy Office (HSEO) binding unless HDOT decided itself to formally adopt it (HDOT Tr. 67:5-20).
Action 4. Develop an inventory of existing data collected by HDOT and analysis tools that can support: a quantification of GHG emission effects of ongoing and to-be implemented HDOT programs and projects; a more detailed inventory and forecast of GHG emissions from transportation sources and sources; and future analysis of GHG reduction strategies. Develop a plan and timeline for quantifying and reporting on emissions. Coordinate with partner agencies (e.g., MPOs) as needed for sharing of data and tools. **Responsibility:** Planning lead, working with environment and with support from other functional areas, including sustainability coordinator for operations, construction, and maintenance, or other designated lead per task force. This could be examined further to be included in the ongoing Hawai'i Statewide Transportation Plan update.	Four months	HDOT has **NOT** developed an inventory of data and analysis tools to support the quantification of GHG impacts of HDOT programs and projects and analysis of GHG reduction strategies. (HDOT Tr. 85:13-86:1). In 2024, it is still **NOT** quantifying and reporting GHG emissions.

Table 2. Source: (pp. D-15 to16 in NCHRP, 2022b).

In sum, HDOT must play a lead role to fulfill Hawai'i's mandate to decarbonize its statewide transportation system. For more than a decade, federal-level agencies and expert authorities have recognized and emphasized the state DOT's key role in reducing transportation sector emissions and have offered guidance and resources—of which the *State DOT Guide* and associated workshop for Hawai'i and HDOT is just another example. But HDOT has continued down

its well-trod path of planning and implementing a system that increases GHG emissions, impairing the environmental future of the young plaintiffs in this case.

B. HDOT's Basic Planning and Programming Perpetuate the Status Quo Statewide Transportation System that Increases GHG Emissions.

Despite its essential lead role in reducing GHGs from the state transportation system, HDOT's existing transportation system planning and programming do not incorporate and effectuate GHG reduction as a priority goal and performance output. Instead, HDOT's planning continues a business-as-usual fossil-fuel-based transportation system. This institutional bias continues into HDOT's programming function, where GHG emissions are also not considered and addressed at the funding and implementation level.

1. HDOT Omits GHG Reduction in Its Performance Framework Governing Its Planning and Programming

As a fundamental starting point, for HDOT to mobilize and act on its mandate to reduce GHG emissions and decarbonize the state transportation system, it must establish an organization-wide GHG performance framework. As the *State DOT Guide* explains, a GHG performance framework would include:

1. **Goals** of the policy (e.g., reduce GHG emissions from the transportation sector).
2. **Objectives** for the policy (e.g., how the State DOT plans to reduce GHG emissions).
3. **Targets** for near-, mid-, and long-term emission reductions (e.g., a percentage reduction in GHG emissions by certain future years from a base year for the state transportation sector).
4. **Performance measures** to gauge the State DOT's progress in meeting its goal and targets.
5. **Protocols** for how the State DOT will **communicate and update the policy and report progress** (in plans, program and project documentation, project-level reporting, a performance dashboard, task force meetings, etc.)**.**

6. **Identification of which functional group(s)** within the State DOT **is responsible** for leading policy implementation and coordinating with other groups.

This performance-based framework is an established, foundational practice for state DOTs. All DOT organizations, including HDOT, govern their planning and operations based on this framework, which is also known by other names, including the "performance feedback loop," the "plan-implement-evaluate-act" cycle, and the "continuous improvement" system. "And if GHG mitigation is to prosper within the DOT management system, it should use the system" to drive its performance in reducing GHG emissions. (NCHRP, 2022a).

HDOT is fully aware of these performance-based principles, but chooses not to implement them to replace the legacy transportation system with the decarbonized system necessary to protect the children in this case from the harms from GHG pollution. In its annual reports on its operations to the Legislature under Act 100 (1999),[5] HDOT lists its goals for the Highways Division. For each goal, the reports include a link to a graphic that shows HDOT's "performance feedback loop,"[6] which is the very framework described above:

[5] Act 100 requires all agencies to report annually on their operations to the Legislature. Currently, HDOT produces its Act 100 reports for the Highways Division in website format. (HDOT, Act100 Report Portal). It also submits a separate Act 100 report document that includes the Airport and Harbors Divisions. (HDOT, 2023c).

[6] See, e.g., Highways Division Act 100 report under the "Improve Safety" Goal.

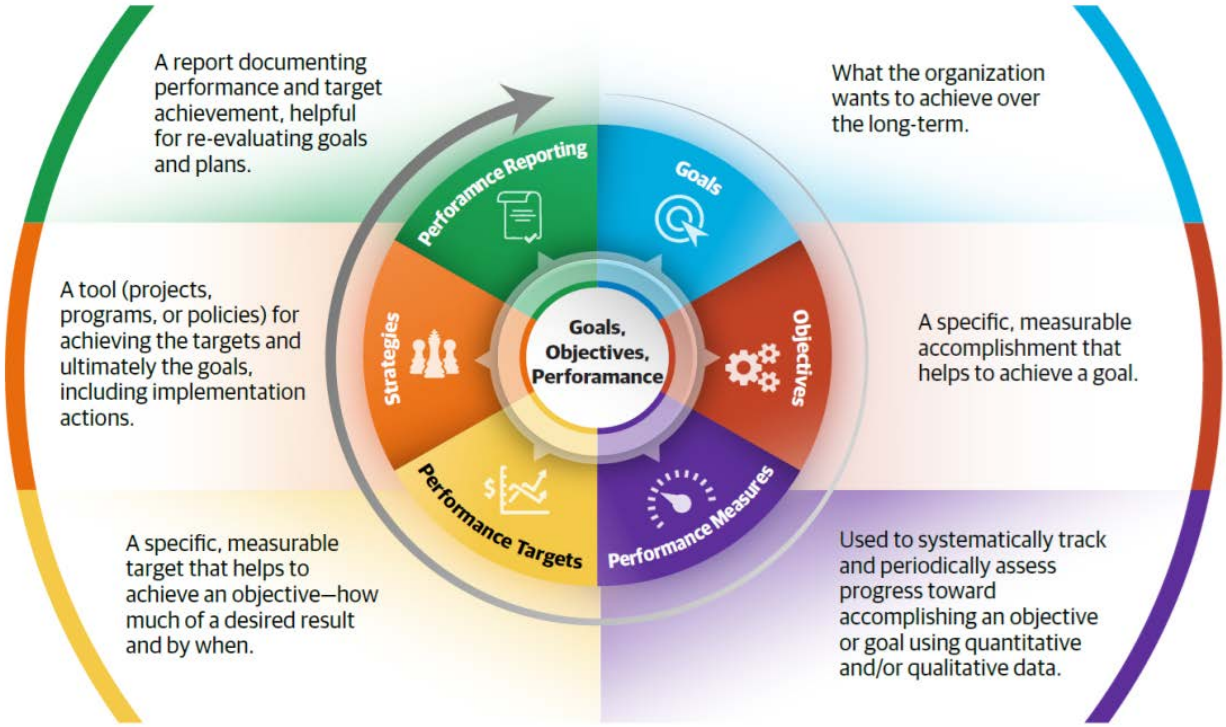

Figure 3. Source: (performance feedback loop graphic from HDOT, 2023d) (misspellings in original).

Further, HDOT's Act 100 reports identify the Highways Division's six "highest priority goals" and provide objectives, performance measures, and targets, as summarized in the following table, none of which include decarbonization as a highest priority goal. (HDOT, 2023c).[7]

[7] Similarly, HDOT's Act 100 reports for its Airport and Harbors Divisions do not include mandates for reducing GHG from the transportation sector. (HDOT, 2023c). In fact, the Harbors Division's goals refer to "[s]upporting the State's energy goal of 70% clean energy"—instead of the 100% clean energy mandate established in 2015 (Act 97, HRS § 269-92). Thus, the Harbors Division's stated goal is almost a decade out of date, apart from not mentioning transportation decarbonization at all.

HDOT Highway Division Six "Highest Priority Goals"

Highest Priority Goal:	Objectives	Targets	Performance Measures
Improve Safety	1. Reduce fatalities and serious injuries on Hawai'i's Highways and bridges. 2. Reduce fatalities and serious injuries of non-motorized modes	Serious injuries: CY 2023: 363 CY 2022: 427 CY 2021: 427 CY 2020: 401 CY 2019: 432 Fatalities: CY 2023: 0 (actual 94) CY 2022: 0 (actual 116) CY 2021: 103 CY 2020: 101 CY 2019: 110	Number of fatalities Rate of fatalities Number of serious injuries Rate of serious injuries Number of non-motorized fatalities and non-motorized serious injuries
Foster System Preservation	1. Improve pavement conditions 2. Improve bridge conditions 3. Preserve and improve other assets	Federal Highways Administration 2-Year Targets for Interstate/Non-Interstate NHS: Good Condition: 25%; Poor Condition: 4% Federal Highways Administration 2-Year Bridge Condition Targets: Good Condition: 25%; Poor Condition: 4%	Pavements by condition Bridges by condition
Improve System Efficiency	1. Improve system efficiency		Travel Time Reliability
Multi-Modal Integration	1. Invest in bicycle and pedestrian improvements 2. Improve bicycle and pedestrian safety, access and network connectivity		Bike and ped expenditures Number of projects with bike and/or ped improvements Bike and ped facilities
Encourage Economic Vitality	1. Improve travel time reliability for trucks		Truck travel time reliability index (TTTR) Estimate of new jobs supported in calendar year
Improve Resiliency	1. Improve resiliency by incorporating design adaptation standards 2. Increase redundancy in the transportation system		Percentage of projects with a resiliency component

Table 3. Source: (HDOT, 2023d; HDOT, 2023c).

As a threshold problem, HDOT has not set any targets to achieve any goals or objectives for decarbonizing the state transportation system. "[N]umerical targets or other measurable values facilitate future assessments of whether overall goals and objectives—such as reducing [GHG] emissions—were achieved, because comparisons can easily be made between projected performance and actual results." (U.S. GAO, 2023). In other words, measurable targets establish commitments and ensure accountability. HDOT, however, has

established no such targets for GHG reduction in any of its planning, programming, and operations.

In particular, as of late 2023, HDOT had no position as to the amount of GHG emissions that must be reduced from the transportation sector to achieve the 2045 decarbonization deadline. (HDOT Tr. 233:23-234:2). Nor has HDOT established any specific targets indicating *how* it will meet this mandate (for example, through electrification, reduction of vehicle miles traveled, and increased share of travel by walking, cycling, public transport, and shared modes). Further, based on best practices, such targets should include interim benchmarks to ensure HDOT is making timely and measurable progress toward its goals. HDOT has no such guideposts for performance.

In contrast to HDOT, other state DOTs have committed to reducing GHG emissions from the transportation sector as an established part of their DOT mission. The DOTs in California, Colorado, Minnesota, Oregon, and Washington, for example, have set performance frameworks for GHG reduction, including goals, objectives, targets, and performance measures. (NCRHP, 2022b). These DOTs made these commitments and started taking action up to a decade or more ago, during the same time that HDOT has had to take action for Hawai‘i, but HDOT has instead stuck to the same planning performance frameworks that keep the legacy system locked in.

Thus, as of 2024—the halfway point between the enactment of the 2045 Zero Emissions Target (ZET) and the interim limit of 50 percent reduction by 2030—**HDOT still has not established a performance framework for reducing GHG emissions from the transportation sector**. Instead, its performance priorities preserve the legacy transportation system. This inevitably produces poor performance by HDOT on reducing GHG emissions in its essential planning and programming functions, to the detriment of the children plaintiffs in this case.

2. *HDOT's Transportation Plans Perpetuate a Fossil Fuel-Based Transportation System.*

Transportation infrastructure investments take advance planning, and infrastructure investment decisions made today set the course and the resulting impacts for decades into the future. Thus, to decarbonize the state transportation system, DOTs must fully align their planning functions and work products with that goal. No state, including Hawai‘i, could hope to reach a goal like the ZET

without systematic and successful transportation systems planning for GHG reductions.

The NCHRP *State DOT Guide* emphasizes the importance of incorporating GHG reduction goals in DOT system-level transportation planning. The GHG emissions from a state DOT's own internal operations (e.g., its in-house vehicle fleet, building operations, and project construction activities), while important, do not cover the full scope of the emissions from the overall transportation system that HDOT oversees. The DOT's "[s]ystems-level policies and investments affect overall travel patterns and transportation technologies and therefore provide the greatest opportunity to reduce transportation GHG emissions." Thus, a committed plan for system-level transportation decarbonization should include: developing an inventory and baseline of transportation sector emissions; setting goals and targets for reductions; and identifying and evaluating strategies to achieve the goals and targets, including alternatives. (NCHRP, 2022a).

In my expert opinion with decades of experience, to decarbonize the transportation system, state DOTs must begin at the system level of high-level planning, then carry through these plans to all its implementation activities for the transportation system, including project programming and prioritization, development and design, and operations and maintenance. The DOTs must also proactively coordinate its transportation system planning with the planning work in other sectors (e.g., electric system planning to support the mass electrification of vehicles and integrated land use and transportation planning to reduce VMT). As of 2024, HDOT has done none of this.

Examples of HDOT's high-level planning documents include the HSTP and LRTP discussed above. Neither of these documents contain systematic GHG reduction as a governing principle for HDOT's system-wide planning. They remain focused on perpetuating, rather than transforming, the current system. Regarding GHG reduction, HDOT admitted it has various individual "initiatives" it is pursuing (e.g., electrifying its internal fleet, using carbon-injected concrete, and allowing EVs to utilize the HOV lane),[8] but "plans[,] not necessarily." (HDOT Tr. 64:17-25). HDOT's planning documents "are general in nature" and "really don't dictate or indicate the climate mitigation measures that we take." (HDOT Tr. 75:3-76:5).

As of 2024, HDOT is still in the process of amending its highest-level plans, in which the agency says that GHG reduction "will be looked at" for inclusion as

[8] See Defs.' Answer to Interrog. No. 5 and Response to Req. for Produc. No. 5.

a priority goal. (Tatsuguchi Tr. 83:17-85-6). HDOT's HSTP, which "establishes the framework to be used in the planning of Hawaii's transportation system," includes under its "Environment" goal the "Objective" of "Support the statewide goals of carbon neutrality and 100% clean energy by 2045." (HDOT, 2022a). By HDOT's own definition in its "performance feedback loop" (HDOT, 2023d), this vague intention to support statewide goals is not an objective: it is neither "specific," nor "measurable," nor an actionable "accomplishment." Likewise, the LRTP references only climate *adaptation* (not decarbonization) with respect to climate change, coined as "Promote long-term resiliency" under a broad goal of "Environment and Sustainability," with only passing mention of "considerations to reducing contributions to climate change from transportation facilities." (HDOT, 2014).

As another example of how HDOT perpetuates business as usual in its high-level planning, in its 2023-25 biennium budget to the Legislature, HDOT provides a "Program Plan Narrative" for each of its airport, harbor, and highway facilities. (State of Hawai'i, 2022b). No mention of GHG reduction or the State's decarbonization mandates appears anywhere in these narratives. GHG reduction is not mentioned under the discussion of "Key Policies Pursued." It is not even mentioned under "Major External Trends Affecting the Program," although the narratives under this section refer to many other federal and state environmental requirements besides those relating to climate mitigation or decarbonization.

As late as November 2023, HDOT was taking an overtly passive and inactive posture toward shifting its basic planning functions to reduce GHG emissions. HDOT does not do its own inventory of GHG emissions or its own projections of future emissions. (HDOT Tr. 31:12-17). HDOT is aware that multiple State entities have opined on the necessary strategies and goals for the State to reduce GHG emissions from the transportation sector. (HDOT Tr. 111:15-19). Yet, despite reports from the state Department of Health (HDOH) indicating that "Hawai'i is currently not on track to meet the 2030 or 2045 statewide emissions targets" (HDOH, 2023), HDOT is not aware of any changes it has made to its existing policies based on this information (HDOT Tr. 27:23-28-6).

Rather than taking the necessary responsibility for GHG reduction planning, HDOT stated it was waiting for the HSEO to issue a pathways report in the beginning of 2024. But HDOT "wouldn't consider it binding" unless HDOT opts to adopt it. (HDOT Tr. 67:5-20). Rather, HDOT's position is that it has the discretion whether or not to follow HSEO's recommendations, "to the extent we are not directed by the governor or by the legislature." (HDOT Tr. 68:5-13).

In sum, based on my experience working with other DOTs, such a status quo approach by HDOT is an abdication of the state DOT leadership and whole-of-government commitment necessary to achieve Hawai‘i’s mandates to decarbonize the transportation sector and the entire state. HDOT’s approach guarantees that transportation sector emissions will continue at business-as-usual levels, and Hawai‘i will not meet its GHG reduction mandates, harming the children plaintiffs in this case.

3. HDOT Prioritizes Fossil Fuels in Its Transportation Programming.

Programming is the pivotal stage of implementing higher-level plans and assigning transportation infrastructure funding to a select list of programs, projects, and strategies. As explained above, in this stage, projects are prioritized and approved in the STIP. HDOT’s programming serves as the critical decision point for advancing projects and combining them into the overall program for investments in the transportation system. Thus, “[t]he programming stage offers an important opportunity for the State DOT to play an active role in reducing GHG emissions from the transportation sector.” (NCHRP, 2022a). HDOT’s programming, however, continues to perpetuate a transportation system that increases GHG emissions, for the reasons set forth below.

First, HDOT does its programming without including GHG reduction as a performance goal, criterion, or measure. HDOT admits it has “no process in place for measuring progress” on clean transportation goals. (HDOT Tr. 203:6). In its biennium budgets to the Legislature, HDOT includes a list of performance measures for each of its airport, harbor, and highway facilities. (State of Hawai‘i, 2022b). GHG reduction appears nowhere in these lists.

This continuation of the legacy transportation system without performance measures for transportation decarbonization poses a fundamental barrier to progress. As a practical principle, you cannot manage what you do not measure. This certainly applies to progress on GHG reduction given its basis in hard science and data.

For HDOT’s programming function to work in support of, rather than against, the goal of reducing GHG emissions, HDOT must include GHG reduction as a criterion for project prioritization and selection. HDOT does not do this. I have reviewed HDOT’s STIP document (HDOT, 2024). It provides a mere laundry list of projects, with no transparent information and analysis on how

HDOT selected and prioritized the projects.[9] In particular, it includes no reference to GHG reduction as a factor in prioritizing projects for implementation, let alone one that is weighted as a high priority in line with the State's decarbonization commitments. In my expert opinion, the STIP thus works against decarbonization, not toward it.

Second, HDOT's evaluation and prioritization of projects does not include GHG impacts. HDOT is "not currently" assessing the GHG emissions from each project (HDOT Tr. 32:19-23), nor does it quantify emissions reductions from its projects (HDOT Tr. 131:24-132:6). The head of HDOT's Planning Branch, which conducts HDOT's planning and programming, admits that HDOT "cannot identify . . . how to reduce long-term carbon emissions" in prioritizing projects because it "do[es]n't have the data." (Tatsuguchi Tr. 200:10-25). This perpetuates the ongoing prioritization of projects that increase GHG emissions.

Third, HDOT does not track, quantify, and report the GHG impacts of its projects. The Hawai'i Legislature specifically mandated HDOT to report on GHG reductions for each project and program year; yet three years later, HDOT is still moving projects forward without GHG reporting. (HRS § 264-143). As a result, HDOT perpetuates the legacy system and prevents any transparency for the public and accountability by the agency.[10]

In contrast to HDOT, other state DOTs incorporate GHG reduction into their programming process, evaluate and report the GHG impacts of projects and the overall program, and require consistency with state GHG reduction goals. Massachusetts's DOT, for example, requires the STIP/TIP to be consistent with the state's GHG reduction target; subjects all projects to a GHG assessment of whether they increase, decrease, or have no impact on GHG emissions; and requires the GHG impacts of the program to be evaluated and reported during each STIP/TIP cycle. (NCHRP, 2022b). Oregon's and Virginia's DOTs also

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[9] The STIP includes a "Project Criteria Color Key" that includes seven generalized categories: System Preservation; Safety Improvements; Congestion Mitigation; Modernization; Enhancement; Human Services Transportation Program; and Transit. These are not criteria for project scoring and selection. They refer only to general classifications of projects, which collectively could encompass the entire range of possible projects. They do not indicate why and how the specific projects were included and prioritized.

[10] HDOT created Project Prioritization Requests (PPRs) where a question was added: "Is the project likely or unlikely to reduce carbon and/or greenhouse gas emissions? Explain." However, HDOT does not have a protocol for answering this question or a method for evaluating the GHG emissions for a given project. As a result, for capacity projects, the answer was always "Likely" with the justification that the project would "increase operational efficiency, thereby reducing congestion and vehicle emissions." (HDOT, SmartTRAC Project Proposals). In reality, as discussed further below, building more capacity for cars results in more demand and increases, rather than decreases, GHG emissions without other methods in place for electrifying the transportation system.

incorporate GHG emissions in their STIP planning and project selection process. (FHWA, 2022; NCHRP, 2022b). The Colorado DOT actually terminated highway expansion projects and redirected the funds to non-GHG increasing alternatives. (Miller, 2022). Meanwhile, as of this report in 2024, HDOT's programming is still stuck in the past century, prioritizing infrastructure that promotes the use of fossil fuels and increases GHG emissions.

In sum, in my review of HDOT's planning and program implementation, HDOT continues to perform these functions without regard for GHG impacts, which is contrary to achieving the Legislature's decarbonization mandates. Ultimately, without any rudder or radar for reducing GHG emissions, HDOT's planning and programming is bound to stray from this goal, harming the future environment for the child plaintiffs in this case.

C. HDOT's Systemic Practices in Prioritizing and Funding Projects and Programs Increase GHG Emissions.

1. HDOT Continues to Apply Outdated Criteria and Metrics That Increase GHGs.

Rather than incorporate GHG emissions reductions throughout its planning and programming, HDOT prioritizes projects that increase emissions, either through investing in roadway capacity expansion projects, or prioritizing projects that reinforce the legacy infrastructure built for fossil fuel vehicles over projects for alternative low-carbon modes of transportation. HDOT's planning and programming, in short, exemplify the traditional, one-directional "predict and provide" model of transportation system planning, in which the agency projects continual growth in traditional highway usage, then plans to expand the capacity of the system to accommodate that growth. This traditional approach directly feeds the vicious cycle of escalating traffic and its societal costs and inequities and is fundamentally misaligned with the mandate to decarbonize the transportation system.

Project Prioritization

HDOT's *Highways Division Project Prioritization Guideline* document, which it maintains on its website (HDOT, 2013a), establishes the following list of priorities, which shows that HDOT prioritizes projects that work toward

increasing GHG emissions, such as traditional capacity expansion projects, over projects that work toward reducing GHG emissions, such as bicycle and pedestrian projects:

- "First Priority" includes: "Mandated Projects" (e.g., ADA and EPA requirements); "Safety Projects" (e.g., hazards, guardrails); and "System Preservation Projects" (e.g., bridge repairs, "roadway upgrades (no additional capacity").
- "Next Priority" includes: "Congestion Relief Projects" (e.g., traffic signals, operation improvements); and "Modernization Projects, such as": "Interim Capacity Improvement (road widening)" and "Regular or New Capacity Improvement (new roads or major widening)."
- And the last category, called "**Other Priority**," includes: "Highway Planning and Research"; "Non-highway Improvements" (e.g., baseyards, buildings); "**Bicycle/Pedestrian Facilities**"; "Beautification/Landscaping"; and "Other miscellaneous projects."

HDOT's prioritization guidance reflects the traditional model focusing on road widening as a core part of HDOT's mission, while relegating non-vehicular options to a later, "other" category. This prioritization framework is outdated, inconsistent with decarbonization, and explicitly thwarts the need to reduce GHG, by promoting roadway expansion over multimodal options such as bicycle and pedestrian facilities.

HDOT is continuing to incorporate this capacity expansion bias in its recently developed criteria to guide its Mid-Range Transportation Plan (MRTP), which is a new process that HDOT initiated to "bridge the gap" between the LRTP and the shorter-term STIP. (CH2M, 2020). Experts worked with HDOT to develop a project evaluation framework to utilize when prioritizing projects for the MRTP, called "Smart Transportation Rank Choice" or Smart TRAC, which included a scoring system giving points for "projects likely to significantly reduce long-term carbon emissions." HDOT, however, chose to "significantly deviate[]" from Smart TRAC and instead adopted a different framework that continues to prioritize vehicle-centric projects over reducing emissions, which it calls "MODA." (Haw. Climate Comm'n, 2022a). HDOT explained that it simply abandoned the Smart TRAC framework because HDOT currently "cannot identify . . . how to reduce long-term carbon emissions" and does not "have the information to determine it . . . and give it any points." (Tatsuguchi Tr. 200:4-21).

Performance Metrics

As another example of applying outdated project prioritization criteria, HDOT also continues to use traditional performance metrics for evaluating projects that are tied to accommodating the use of fossil fuels, rather than expanding transportation choices. Specifically, the use of metrics such as "Level of Service" (LOS)[11] promote the traditional bias in favor of accommodating motor vehicles and expanding roadway capacity and should be discontinued, as HDOT has been repeatedly advised. As the Hawai'i Climate Change Mitigation and Adaptation Commission ("Climate Commission")[12] recognizes, because a car-centric metric like LOS "does not reflect a project's environmental impacts, it is not a useful measure for measuring progress toward climate goals." Further, it promotes projects that induce additional traffic and ultimately increase congestion over time and imposes blind spots and barriers against multimodal projects. (Haw. Climate Comm'n, 2022a).

Nearly a decade ago, the Hawai'i Clean Energy Initiative (HCEI) specifically recommended that HDOT: "Replace the Level of Service (LOS) measurement of vehicle flow currently used in environmental impact assessments for potential infrastructure projects with VMT." (HCEI, 2015). Similarly, in 2016, experts worked with HDOT to produce a *Practical Solutions Action Plan*, which identified the need to "provide clear guidance on the use of LOS" and adopt a "new approach," including "replacements for LOS like vehicle miles traveled." (HDOT, 2016). It does not appear that HDOT followed this advice because, in 2022, the Climate Commission again recommended that HDOT "shift from level of service (LOS) and other performance metrics centered on car mobility in investment prioritization frameworks to metrics focused on increasing transportation choices."[13] In response to these recommendations, HDOT

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[11] LOS measures vehicle throughput for an intersection or roadway and typically does not consider non-vehicle modes.

[12] The Legislature established the Climate Commission in 2017 to perform a range of duties, including "provide policy direction, facilitation, coordination, and planning among state and county agencies, federal agencies, and other partners as appropriate"; "establish climate change mitigation and adaptation strategies and goals to help guide planning and implementation statewide"; and "make recommendations for how to meet or exceed Hawaii's state mitigation goals and . . . adopt a liberal approach in preparation, so as to minimize future risk to the people and environment of Hawaii." (Act 32 (2017); HRS § 225P-3).

[13] HDOT officials have stated variously that HDOT has stopped using LOS to prioritize projects (HDOT Tr. 208:19-20) and still uses LOS to determine congestion and identify capacity projects (Tatsuguchi Tr. 80:7-16). Such discrepancies indicate that HDOT still needs to "provide clear guidance on the use of LOS." (HDOT, 2016). HDOT has not produced such guidance (HDOT Tr. 144-22-25), and its practices remain undefined and inaccessible.

expressed "significant concerns," indicating ongoing resistance to such reform. (HDOT, 2022d).

Numerous HDOT documents show that HDOT continues to use LOS as a performance metric. For example, in a Project Programming Request (PPR) form for a major highway widening project, HDOT insists that without the project, "congestion will remain unresolved and will reduce the Level of Service" for the highway. (HDOT, 2022e). Likewise, in the comments HDOT makes on various proposed development plans and projects and their associated transportation infrastructure improvements, it focuses on LOS as the guiding standard.[14]

In my expert opinion, HDOT's continued use of LOS, instead of other performance metrics suited to gauge GHG emission reductions, such as Vehicle Miles Traveled (VMT) and analysis of induced demand,[15] demonstrates HDOT's perpetuation of a legacy transportation mindset and outcomes.

No Transportation GHG Emission Performance Tracking and Reporting

In contrast with its continued priorities and metrics favoring GHG increases, HDOT lacks any protocols for tracking and reporting progress on GHG reduction. Such reporting is not only a fundamental prerequisite for ensuring progress, but also a specific requirement for HDOT in its statute. The Hawai'i Legislature has expressly mandated that HDOT report on its performance and progress on specific goals, including: "Reduce carbon emissions and greenhouse gasses," as well as "Reduce vehicle miles traveled." (HRS § 264-143(a), (b)). "For each project planned by [HDOT]," HDOT "shall create a report detailing" how it implemented these goals, or "any necessary deviations from the goals . . . and the reasons for those deviations." (HRS § 264-143(b)). HDOT must also submit an annual report to the Legislature that includes the reports for each project, as well

HDOT lacks any protocols for tracking and reporting progress on GHG reduction.

[14] Specifically, HDOT requires that developers "shall mitigate all . . . transportation impacts to maintain the operating Level of Service (LOS)" and "may be required to provide mitigation improvements to improve the State facilities" to meet LOS standards. (HDOT, 2021b). Based on LOS analysis, HDOT directs developers to work with HDOT planning engineers to provide highway improvements. (HDOT, 2020).

[15] VMT analysis "can directly capture the value of benefits that are not considered in traditional vehicle [LOS] or travel time analysis," such as improvements to multimodal networks, lower environmental impact including GHG emissions, improvements to health and safety, and reduced public and private costs. (Haw. Climate Comm'n, 2022a).

as a "progress update outlining the department's success in meeting the goals." (HRS § 264-143(c)).

The Legislature established this reporting requirement in Act 131 in 2021. Nonetheless, three years later, HDOT is still not reporting on GHG and VMT reductions. As of late 2023, HDOT admitted it is not measuring GHG impacts for each project and is "still working on that." (HDOT Tr. 265:4-13). HDOT has also contrarily asserted that the reporting mandated by Act 131 is covered by HDOT's Act 100 reports. (Defs.' Resps. to Reqs. for Produc. Nos. 15 & 16). Yet, again, HDOT's Act 100 reports do not include any reference to the goals of reducing GHG and VMT, much less any information and analysis on how HDOT is implementing and meeting these goals.

HDOT's Act 100 reports also do not include the required reports on compliance with these goals for *each* of its projects, or any deviations from these goals and the reasons for the deviations, as required by HRS § 264-143(b). They also do not provide any overall progress update on HDOT's success in meeting these goals, as required by HRS § 264-143(c). In sum, HDOT's disregard of the GHG impacts of its projects and overall operations defeats public transparency and accountability and disregards the Legislature's specific mandates for such performance reporting.

In parallel with HDOT's comprehensive abdication of its duty to establish a performance framework to meet Hawai‘i *state* decarbonization mandates, the agency has only recently begun steps to develop some piecemeal elements in response to much more limited *federal* requirements. Yet, even on that front, HDOT has already missed a major deadline and has shown none of the focus and commitment that best practices require.

In November 2021, the federal government passed the IIJA, which required state DOTs to provide a "carbon reduction strategy" as a minimum condition for the IIJA funding. The law included minimal requirements for the strategy such as "support efforts to reduce transportation emissions" and "identify projects and strategies to reduce transportation emissions," without setting any performance standards or targets. (23 U.S.C. 175(d)). Yet, despite being given two years to comply, HDOT failed to meet the deadline of November 15, 2023; no drafts of the strategy had been prepared by then; and HDOT did not have a sense of when that work would be completed. (HDOT Tr. 71:16-72:6). Many other states, in contrast, were able to meet the deadline and obtain the available federal funding. (WSDOT, 2023; OTC, 2023).

In April 2024, it came to my attention that HDOT had recently issued its *State of Hawai'i Transportation Carbon Reduction Strategy* (CRS) document. As an initial note, HDOT appears to have backdated the document "November 2023," although as stated HDOT had admitted at that time that it would not be meeting the deadline. (HDOT Tr. 71:16-72:6). The document is called an "Initial draft" and also indicates a "Plan expansion" is scheduled for "June 2024." (HDOT, 2023h).

Even though HDOT had two full years to develop its CRS, its currently submitted document comprises a mere 14 pages of content, including tables and pictures. In comparison, other states' CRS submissions illustrate that they are well ahead of Hawai'i in planning and mobilizing to reduce transportation GHG emissions and have submitted far more extensive CRS documents detailing transportation GHG reduction targets, plans, and programs that are already in place and underway. (E.g., CO DOT, 2023; WA DOT, 2023; MN DOT, 2023).

In terms of actual content, HDOT's CRS simply recites the same list of piecemeal activities that HDOT is currently doing. (See Section E below). It offers no unifying vision, plan, or framework at the system level. It intimates no ideas or aspirations for how any of these individual projects may be scalable to achieve rapid sector-wide progress on reducing GHG emissions. It includes no goals, objectives, targets, standardized performance measures at the individual project and aggregate program level—i.e., none of the essential elements of the established DOT performance-based framework.

Perhaps the most problematic aspect of HDOT's CRS, however, is that it includes **numerous *roadway capacity expansion projects* as "carbon reducing" strategies**. Several expert transportation organizations have been raising the alarm on states using federal IIJA funds to double down on traditional roadway expansion projects, with one organization calling this trend a "***climate time bomb***." (Salerno, 2024) (emphasis added). Decades of peer-reviewed scientific studies have established that expanding road capacity proportionately increases VMT and the resulting GHG emissions. (See section C.3 below).

Under the heading "Reduce Emissions," HDOT's CRS features four projects—"Interstate Route H-1 East Bound Improvements" (O'ahu); and "Farrington Highway Widening" (O'ahu); "Puunene Avenue Improvements" (Maui); "Honoapiilani Highway Realignment" (Maui)—that explicitly expand roadway capacity as their principal purpose and result. Three of these projects (H-1 Eastbound; Farrington Highway; and Puunene Avenue) were included among the nine projects that transportation experts analyzed for the Climate

Commission. This analysis found that the nine projects would add 144 million VMT and 1.65 million tons of GHG emissions, equivalent to 19% of the state's current total transportation emissions. (RMI, 2022; section C.3 below).

I am not aware of any analysis that HDOT has conducted on the VMT and GHG emissions impacts of any of these capacity expansion projects. Based on the science of roadway expansion impacts and the Climate Commission's publicly provided analysis, however, HDOT's bid to promote these projects as pillars of its "Carbon Reduction Strategy" should cause grave concerns that HDOT is building its own "climate time bomb" in Hawai'i.

The IIJA, indeed, ties its Carbon Reduction Program funding to projects that "*support the reduction of transportation emissions*," listing numerous eligible categories, none of which include capacity expansion projects. (23 U.S.C. § 175(c)(1)) (emphasis added). Further, the list of eligible projects explicitly *excludes* capacity expansion projects, in allowing projects that improve traffic flow (e.g., traffic management and operations) but do "***not result in the construction of new capacity***." (23 U.S.C. § 175(c)(1)(L)) (emphasis added). HDOT's inclusion of its capacity expansion projects in its CRS, therefore, flies in the face of the federal Carbon Reduction Program's exclusion of such projects and its express purpose to reduce transportation emissions.

On November 22, 2023, the U.S. DOT (FHWA) finalized a rule establishing a GHG performance measure based on the percent change in vehicle emissions on the mainline highways of the National Highway System (NHS)[16] in relation to a baseline year of 2022. (88 FR 85364). The rule requires state DOTs to establish declining emission targets for two and four years in the future and gives a deadline of February 1, 2024 to set the targets. The US DOT considered the GHG performance measure as only a "first step toward reducing GHG emissions." The federal rule does not mandate what the targets must be, only that they "aim to reduce emissions over time." It also covers emissions on only the subset of roads in the NHS, and not the entire statewide transportation system. It does not include any penalties for non-compliance. This recent rule, in sum, sets a minimum federal floor requirement to take just a first step of setting some initial GHG reduction targets, which is no substitute for the comprehensive performance framework needed to fulfill Hawai'i's state decarbonization mandates.

[16] The NHS includes freeways and main highways, which constitute only a partial subset of the State's roadways that HDOT oversees.

The discussion around this rule to set a GHG performance measure at the federal level dates back to the Obama administration, which originally issued a similar rule seven years ago in 2017. The Trump administration rescinded the rule, and the Biden administration revived it in 2022. Thus, HDOT has known for years that, even at the federal level, the government has recognized the need to start requiring minimal first steps toward reducing transportation sector emissions.

Nevertheless, HDOT has already missed a deadline on the federal side, and it is nowhere near to reaching a level of diligence and progress on par with meeting Hawai‘i’s far more extensive decarbonization mandates. Instead, HDOT’s abdication of its duty and perpetual delays over these years simply underscore how much time and ground HDOT has already lost and must now recover. In 2024, HDOT still has no organizational structure and direction to implement Hawai‘i’s GHG reduction directives.

2. HDOT Diminishes and Disregards System-Wide Electrification.

In particular, HDOT has not used its authority to facilitate electrification of the transportation system, one of the most important decarbonization strategies. Electrifying transportation is the foundation to decarbonize the system, yet HDOT has no comprehensive targets or plan to accomplish that objective. HDOT’s current program for building charging infrastructure for electric vehicles assumes 45% fossil-fueled vehicles in the state in 2045, which is not an objective or target that comports with the State’s net-zero mandate. (HDOT, 2022a). HDOT has also not identified any objectives for increasing the use of alternative fuels in transportation, another key decarbonization strategy.

Through my previous leadership position in New York City’s DOT, I have direct experience in developing a DOT vision and action plan for electrification, which we set forth in *Electrifying New York: An Electric Vehicle Vision Plan for New York City*. (NYC DOT, 2021a). This plan offers an example of a DOT embracing its essential government leadership role in enabling the electrification of transportation.

NYC DOT recognized that in addition to continuing to expand multimodal options,[17] it also "must do its part" to help drivers switch to electric vehicles by building out a public charging network. NYC DOT found that the local EV market was ramping up too slowly, lagging behind California and European peers, and that the lack of charging infrastructure remains one of the most significant barriers because it suppresses demand for EVs, which in turn discourages private sector investment in EV charging. Thus, "the next few years represent a critical opportunity to accelerate EV adoption," in which the DOT can "fill this need by providing and incentivizing EV charging infrastructure," which helps seed the market and spur investment in a comprehensive charging network.

NYC DOT recognized its plan as "a critical step in catalyzing a local EV market and fundamentally transforming how drivers get around our city." It "will require a transformative public investment over a short period of time," to scale up the early groundwork laid by other agency efforts. The DOT also recognized its government role in ensuring that the charging infrastructure is distributed equitably and not just concentrated in higher-income areas.

NYC DOT's plan committed to a list of coordinated and complementary actions. These included setting near-term targets of 2025 and 2030 for investments in: expanding the city-operated fast charging (level 3) network; equipping 40% of the spaces in municipal parking lots and garages with level 2 chargers; and creating a network of thousands of curbside charge points, including an innovative plan to enable plug-in charging from the streetlight infrastructure. The DOT recognized these targets, which "require immediate and significant action," are a critical step to meeting GHG reduction goals, but just the first step, on which the DOT will build by seeking further partnerships with other government agencies and the private sector.

HDOT, in contrast, has taken a passive and reactive approach to building the statewide EV charging network. Rather than taking initiative to fulfill the State's decarbonization mandates, HDOT has only moved in reaction to bare minimum federal-level requirements imposed as a condition for funding and, even then, has sought substantial exemptions and years of delay. The National Electric Vehicle Infrastructure (NEVI) program required HDOT to undertake an initial minimum phase of installing fast charging facilities. HDOT's proposal, submitted in 2022, included only eight fast charging stations, requested exemptions from the

[17] This work includes expanding on hundreds of miles of bike and bus lanes; improving the most successful bike share program in the Western Hemisphere; and making walking safer and more convenient by shortening crossings, widening sidewalks, and installing pedestrian facilities. "As a result, more New Yorkers can leave their cars at home, or choose not to buy them at all."

requirements to install five others, and planned the addition of ten level 2 stations over the next five years. The "Vision" of HDOT's NEVI "plan" is a network of charging stations "that result in the transition of the majority of light-duty vehicles from internal combustion engines to electric vehicles by 2045." (HDOT, 2023b; HDOT, 2022i). In other words, by the 2045 deadline for statewide decarbonization, HDOT envisions only a majority of light-duty vehicles to be electric. None of this "vision" is connected to or supported by any plan or analysis for decarbonizing the transportation sector. These internal assumptions for continued widespread fossil fuel reliance will not decarbonize the transportation system by 2045 or thereafter.

HDOT has taken this passive and reactive approach toward even its own facilities. In recent years, HDOT built two brand new consolidated rental car parking garages at its Oʻahu and Maui airports, but did not include any electric charging facilities—or even "make ready" installations such as wiring, panels, and other components—to enable EV charging. (HDOT, 2019). As a result, all the necessary equipment will now need to be retrofitted at some later time, at much greater expense. Based on my professional experience, including my work as a transportation administrator developing NYC DOT's EV vision and plan, HDOT's actions and decisions on these facilities demonstrate an astonishing lack of foresight and alignment on the State's clean energy and climate mandates.

3. *HDOT Prioritizes Road Capacity Expansion, Which Increases VMT and GHG Emissions.*

HDOT has also not established any objectives and targets for reducing vehicle miles traveled (VMT), which has long been recognized as another key GHG reduction strategy for Hawaiʻi to accelerate decarbonization and achieve many other co-benefits for people's cost of living, quality of life, and safety, public health, equity, and the economy. (Act 131, 2021). Rather, HDOT continues its legacy institutional practices that increase VMT, along with the resulting GHG pollution and the many other costs and inequities of ever-expanding vehicle traffic.

VMT, which measures vehicle travel in a region over a given time period, is a standard proxy for transportation-related GHG emissions. (Haw. Climate Comm'n, 2022a). For over two decades, the State of Hawaiʻi has emphasized and recommended VMT reduction as a "core strategy" and "key measure" for decarbonizing transportation and meeting the State's clean energy goals, since it is an area over which the State "has direct control." (DBEDT, 1998; HCEI, 2011;

HCEI, 2015; Haw. Climate Comm'n, 2022a). The Legislature has specifically directed HDOT to "Reduce vehicle miles traveled." (HRS § 264-143(a)(3)).

This recognition of the need to reduce VMT, and in turn GHG emissions, however, stands in contrast with the performance of the State—including its head transportation agency HDOT—on actually committing to, planning for, implementing, and achieving such reductions. Importantly, **HDOT has affirmatively planned for a 10% increase in VMT on state roads and highways over the next eight years in its latest budget**. (Haw. Climate Comm'n, 2022a). VMT data from the state Department of Business, Economic Development and Tourism shows that VMT remains persistently high and has not declined to levels in accordance with even the initial targets the State set years ago in the HCEI.[18] In its own budget documents, HDOT planned for VMT, and thus GHG emissions, to continue to increase through 2027. (State of Hawai'i, 2020).

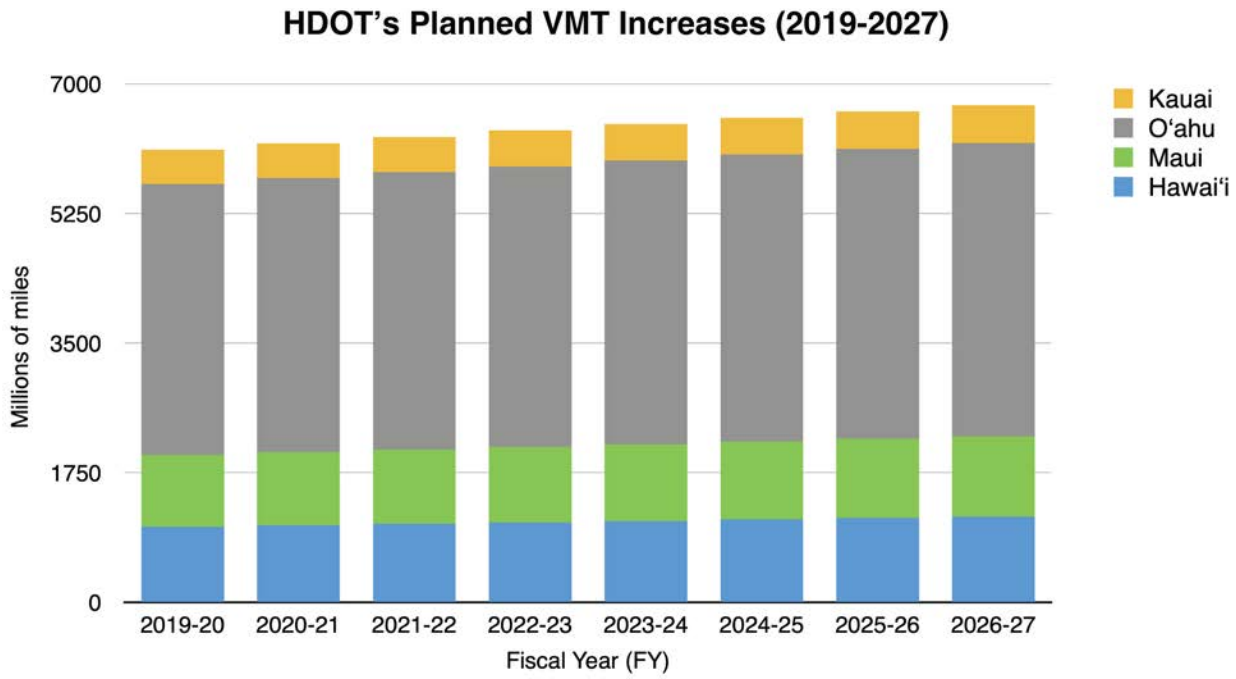


Figure 4. Source: (State of Hawai'i, 2020).

In addition, in 2022, the Hawai'i State Climate Commission (see footnote 12 above) reported that "**VMT in Hawai'i has increased almost 40% over the last 25 years and is projected to continue to increase without intervention**" (emphasis added). Since the year 2000, both total VMT and per-capita VMT have

[18] Based on a document produced in discovery it appears HDOT's tracking of VMTs is consistently lower than DBEDT's. (HDOT, Statewide AVMT).

increased. VMTs do not increase without support from HDOT. In the legacy system it operates, when VMTs increase, so do GHG emissions. The Climate Commission has identified these historical and ongoing VMT increases as "a barrier to Hawai'i achieving its legislative climate action goals." According to the State's own findings, "**[t]o achieve Hawai'i's negative carbon emissions goal by 2045, VMT cannot continue to grow**." (Haw. Climate Comm'n, 2022a) (emphasis added).

HDOT, for its part, at least agrees that reducing VMT is a means to reduce GHG emissions. (HDOT Tr. 112:5-7). Yet, **HDOT has continued its legacy system that increases VMT; has done little or nothing to drive progress on the key, mandated goal of reducing VMT; and has undermined this goal in many critical respects.**

The State's legacy transportation system and practices impose a significant barrier to achieving the necessary, urgent progress on reducing GHG emissions. Specifically, the century-old transportation system model is geared toward expanding road capacity for cars, which directly increases VMT and the resulting GHG emissions. The Hawai'i Legislature in Act 131 provided critical findings on this problem that are worth reviewing in full because they accurately reflect the established understanding and best available science in this field:

> **Merely adding lanes to reduce traffic does not address Hawaii's most pressing traffic, safety, health, and other issues**. In fact, it can often make them worse. Studies show that the traffic benefits of spending tens of millions of dollars adding lanes to accommodate more cars are often eliminated in just a few years by additional cars incentivized to fill that space. Those funds could have had a more significant and longer-lasting benefit if they were expended to address other issues, such as expanding options for people to commute by public transportation, biking, or walking, especially for those in low-income communities (emphasis added).
>
> **(**Act 131 (2021)).

In line with the Legislature's express findings, the Climate Commission has recognized that "BUILDING MORE ROADS LEADS TO MORE TRAFFIC AND GREENHOUSE GAS EMISSIONS" (Haw. Climate Comm'n, n.d.) (emphasis in original). In 2022, the Commission worked with transportation experts at RMI to estimate the long-term impacts of nine major HDOT roadway expansion projects. As summarized in the following table, the analysis indicated

that the projects planned and prioritized by HDOT would add 144 million VMT (equivalent to an additional 11,100 cars on the road) and 1.65 million tons of GHG emissions (equivalent to 19% of the state's current total transportation emissions).

Climate Commission Analysis of HDOT Road Expansion Projects (2022)

Impacts	Units
Lane-miles	38 lane-miles
VMT	144 Million
Gallons of Gasoline Eq.	5.6 Million
Cars Eq.	11,100 Cars
Emissions Eq.	1.65 MMT CO2e

Table 4. Source: (Haw. Climate Comm'n., n.d.)

"Studies consistently show that increased capacity induces additional VMT." (Handy & Boarnet, 2014a). This direct relationship between expanding road capacity and increasing VMT—also known as "induced demand"—has been documented in an extensive body of research spanning the better part of a century. (Volker & Handy, 2022) (surveying seminal studies). This body of work includes empirical and econometric analysis and peer-reviewed publications examining decades of data across broad and diverse geographies and controlling for other factors. The science is widely accepted as establishing the "Fundamental Law of Road Congestion," in which VMT increases proportionately with road capacity expansion and eliminates much or all of the traffic congestion benefits of the added capacity over time, within as soon as five years. (Duranton & Turner, 2011; Cervero & Hansen, 2002; Handy & Boarnet, 2014a; Handy & Boarnet, 2014b; Volker et al., 2020). This impact feeds a negative feedback loop exacerbating all the costs of the legacy transportation system dependent on fossil fuels that the Hawai‘i Legislature recognized.

Further, **once road expansion is installed, the VMT increases are locked in**—unless and until additional work may be undertaken to undo the induced demand impacts, such as road congestion charges or reallocation of roadway capacity for other modes. The science confirms that the expanded capacity will be filled, and adding alternative transportation options, such as transit, will not limit the VMT impacts of the road expansion. (Duranton & Turner, 2011). Thus, given the decades-long lifespan of roadway investments, the resulting VMT and GHG increases will persist in counteracting the climate benefits of other transportation system improvements well into the future, absent extra interventions to counter the impacts.

These lasting climate consequences of HDOT's infrastructure decisions to prioritize capacity expansion over infrastructure needs for alternative modes of transportation underscore the need to examine and address the VMT impacts now, before the impacts are locked in for future generations. Indeed, based on the established science and the findings of Hawai'i's own Legislature, Climate Commission, and State Energy Office, this need to address capacity expansion, induced demand and VMT impacts is not, or should not, be unknown or in dispute by the State and its HDOT. The actions of HDOT, however, have not matched these understandings and requirements.

Figure 5.

4. HDOT Has Known, Yet Disregarded and Resisted, the Need to Reduce GHG Emissions by Reducing VMT.

The State and HDOT have long been aware of the need to reduce VMT, which in turn has been shown to reduce fossil-fuel reliance and GHG emissions. For years, HDOT has been repeatedly informed and directed to take actions to reduce VMT, yet has disregarded these recommendations and requirements. For example:

- In 1998, the State produced its Hawai‘i Climate Change Action Plan, advising that "[t]hose measures that show the greatest energy-saving potential in the short- and mid-term operate by reducing total regional VMT through travel mode shifts away from single occupant vehicles, or by decreasing the need for travel." (DBEDT, 1998).
- Reducing VMT has likewise been a long-standing centerpiece of the federal Highway Performance Monitoring System, which guides how HDOT should spend federal transportation dollars. FHWA has declared that "reducing vehicle miles traveled (VMT) is an official goal of the U.S. Government policy," which dates as far back as the Clinton administration's 1993 Climate Change Action Plan and is recognized in numerous federal laws relating to clean air and transportation efficiency and equity. (FHWA, n.d.).
- In 2011, the HCEI, a joint program between the State of Hawai‘i and U.S. Department of Energy, identified the reduction of VMT as a "core strategy" that was "critical to the success" of the State meeting its goal of 70% reduction in petroleum use for ground transportation by 2030. (HCEI, 2011).
- In 2015, HCEI produced another report admitting that progress in the transportation sector had "not met expectations," recognizing "the need for a renewed effort," and identifying several strategies that could be implemented to reduce VMT. (HCEI, 2015). The state energy office issued the report as a "first step" that included "nearly two dozen tactics to be pursued now," as well as "enabling actions" for longer-term tactics. (HCEI, 2015).
- The Hawai‘i Legislature established the ZET in 2018 (Act 15, HRS § 225P-5); the specific goal of "decarbonizing the transportation sector" in 2021 (Act 74, HRS § 225P-7); and, also in 2021, Act 131, which mandated HDOT to "Reduce vehicle miles traveled" and "Reduce carbon emissions and greenhouse gasses" when "planning, designing, and implementing ground transportation infrastructure for each project," and requiring HDOT to report on these goals for each project and for its overall program in each year (HRS § 264-143).

- Also in 2021, the US Climate Alliance, which includes the State of Hawai‘i as a member, supported Smart Growth America and the State Smart Transportation Initiative to produce a report, Drivers of VMT and Priority Reduction Strategies. (SSTI, 2021). The project’s purpose was to provide “short-term direct technical assistance” to nine select states, including Hawai‘i, to support efforts to reduce VMT. The report provided analysis of VMT trends and key strategies for VMT reduction in Hawai‘i. Its findings included:
    - VMT in Hawai‘i increased by 39% since 1994, including around 8% between 2009-17. But more than 60% of personal trips are under five miles and account for up to 20% of VMT, which “presents important opportunities for more trips to be made by walking, biking, and transit, under the right policies and investments.”
    - “There is great potential in Hawai‘i to focus on VMT reduction efforts” by state and local governments, including HDOT. Priority strategies included, for example, reining in spending on road expansion, and investing in broader and safer transportation options such as transit, bike, and pedestrian improvements.

Despite all this, at the end of 2023, **HDOT admitted it still has not adopted a goal or target for VMT reduction**. (HDOT Tr. 126:25-127:12). Further, its head of Planning for highways was **“not sure” that the Legislature had ever directed HDOT to reduce VMT**. (Tatsuguchi Tr. 69:3-6).

In January 2022, the long-running calls for the State and HDOT to reduce VMT prompted the Climate Commission—of which the HDOT Director is a member—to issue a *VMT Reduction Toolkit and Policy* by its consultants. (Haw. Climate Comm’n., 2022b). This material was then incorporated into a comprehensive guide on VMT reduction dated December 2022, entitled *Investing in Transportation Choices: Recommendations for Safe, Sustainable, Affordable and Reliable Mobility* (“*Transportation Choices*”). The report found: “**State goals will not be achieved without a reduction in ground transportation emissions. Continued increases in [VMT] will prevent Hawai‘i from achieving its adopted carbon net negative by 2045 climate action goal.”**

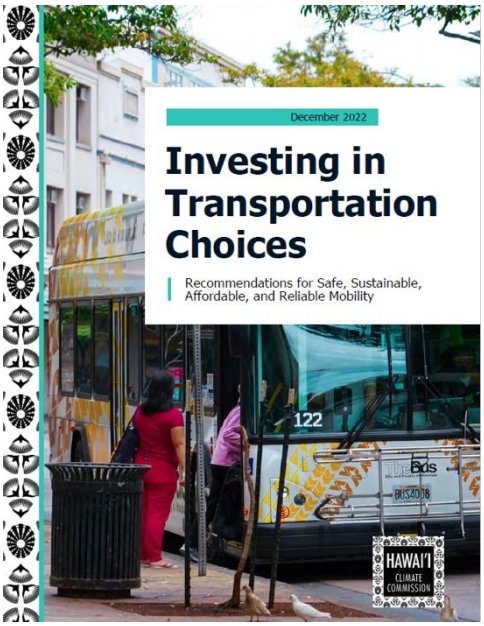


Figure 6. Investing in Transportation Choices Report Cover.

Transportation Choices provides extensive recommendations for "near-term steps that Hawai'i state departments can implement to initiate and sustain progress toward VMT reduction." Many of these recommendations speak directly to HDOT's governance role, yet have not been implemented.

Transportation Choices Recommendations

Recommendation	Implemented?	Source
Articulate a Goal and Champion Investing in Transportation Choices		
Develop and adopt a statewide VMT reduction target.	No	*HDOT Tr. 126:25-127:12; 168:12-20*
Develop and implement a strategy to integrate VMT into project-level analysis and decision-making for land use and transportation projects.	No	*HDOT Tr. 138:2-10*
Establish a VMT reduction coalition across State agencies.	No	*HDOT Tr. 128:22-129:10*
Track Progress: Produce an annual multi-departmental report that measures the effectiveness of VMT policies.	No	*HDOT Tr. 129:11-21; Shishido Tr. 59:18-21; Dill Tr. 113:12-17*
Measure VMT impacts and establish standards of performance for VMT impacts.	No	*HDOT Tr. 130:14-23*
Require induced demand and VMT analysis for transportation projects.	No	*HDOT Tr. 145:5-22*
Realign Funds and Spending to Support Policies, Programs and Projects that Reduce VMT and Support Mode Shift		
Direct investments in transportation and land use towards projects that reduce the energy intensity of mobility through the expansion of transportation choices.	No[3]	*[see section C.5 below]*
Give people in Hawai'i more safe, affordable, reliable, inviting and convenient choices to get around by funding the completion of our pedestrian, bicycle, transit and green networks.	No	*[see section D below]*

Table 5. Source: (Haw. Climate Comm'n., 2022a and cited testimonies).

In sum, HDOT has simply chosen not to examine the VMT impacts of its road expansion projects and continues to implement its plans and programs so as to exacerbate GHG emissions, harming the young people who are plaintiffs in this case. Further, **HDOT's pushback against the Climate Commission's efforts to encourage VMT reduction indicates a critical lack of alignment in the Hawai'i State government**. At the most fundamental practical level, Hawai'i cannot achieve its goal of decarbonizing the transportation sector if its lead transportation agency HDOT is perpetuating the legacy system and refuses to take its leadership role in decarbonizing the transportation system. In my expert

opinion, VMT will continue to rise under HDOT's legacy plans, programs, projects, budgets, and operations. That means GHGs will continue to rise as well.

5. *HDOT's Transportation Investments Reflect the Institutional Bias Toward Projects That Increase VMT And GHG Emissions.*

HDOT agrees that "the projects HDOT funds reflects HDOT's priorities." (HDOT Tr. 146:7-9). Based on my review of transportation infrastructure budgeting documents, HDOT has created a transportation project funding framework that does not consider VMT reduction and instead prioritizes projects that increase VMT. This in turn has produced a system that is geared toward increasing GHG emissions.

The Climate Commission confirms the "Current Situation" is that "Transportation investments and land use[19] plans increase VMT." It thus recommends that HDOT "**Realign Funds and Spending to Support Policies, Programs and Projects that Reduce VMT and Support Mode Shift**." (Haw. Climate Comm'n, 2022a) (emphasis added).

As discussed above in section C.1, HDOT does not consider and report the impacts of its projects on GHG emissions or VMT, despite specific direction by the Legislature to do so. In the absence of such basic information, I conducted an independent review of the State's transportation infrastructure budgets to assess the priorities of these budgets in relation to Hawai'i's decarbonization goals. The methodology for this review is included in **Attachment 3** to my expert report.

The following table summarizes the aggregate totals for the 11-year dataset:

[19] HDOT acknowledges it "plays a role with respect to land use decisions" that can impact VMT (HDOT Tr. 76:17-19) and is "able to influence" the decisions that developers make. (HDOT Tr. 125:10-14). Among other measures, it is able to leverage or deny its support for projects and refuse to fund transportation infrastructure for developments that are inconsistent with the State's goals. (HDOT Tr. 123:23-126:8). HDOT, however, has not objected to a project on the ground that it would increase VMT (HDOT Tr. 136:4-6)—which is unsurprising since HDOT does not consider or analyze VMT reduction in the first instance. In fact, of the numerous HDOT comment letters I have reviewed in preparing my report, not once has HDOT objected to a project on the ground that it would increase VMT. (HDOT, Comment Letters).

VMT Impact and Budget Share Aggregate Totals, 2013-2023

VMT Impact, Totals 2013-2023:	Budgeted Amount (Federal)	Budgeted Amount (State)	Total Budgeted Amount
VMT Increasing •	$950,388,000	$2,127,065,000	$3,077,453,000
VMT Neutral •	$3,184,431,200	$1,837,296,200	$5,021,727,400
VMT Decreasing •	$100,984,800	$106,572,800	$207,557,600
VMT Neutral with GHG Reduction •	$90,402,000	$59,884,000	$150,286,000
Insufficient Information Provided •	$86,624,000	$67,893,000	$154,517,000
Total Budgeted Amount	**$4,412,830,000**	**$4,198,711,000**	**$8,611,541,000**

Table 6. Source: (Attachment 3).

My review and analysis of these comprehensive data produced the following findings:

First, looking at the average of the annual percentage shares for each category over the entire 2013-2023 period, HDOT's highway capital improvements budgets allocated the vast majority of its funds (94%) for projects that increase VMT (33%) or have no impact on VMT (61%); and a minimal remaining share for projects that either reduce VMT or are VMT neutral but reduce GHG emissions (2% each, totaling 4%). The 33% share of VMT-increasing projects is more than eight times the 4% share of VMT- or GHG-reducing projects.

Moreover, even the 61% share of VMT-neutral projects can be seen as a "lost opportunity" for prioritizing more funds toward projects that reduce GHGs. (Rubin et al., 2023). As further discussed below, Hawai'i's "Complete Streets" mandate requires HDOT to include multimodal improvements for all users and modes in its road construction and maintenance projects. (HRS § 264-20.5). The mandate's intent "is to redesign Hawai'i's built environment to support active transportation." (Univ. of Hawai'i at Mānoa, 2011). Yet, from 2013-23, only a 2% budget share was allocated for VMT-reducing projects supporting other transportation modes. In terms of number of projects, only 15% of the total budgeted projects (279 of 1,872 projects) included a pedestrian or bicycle component. **These findings indicate that the overwhelming share of funds and projects continue to be directed toward supporting motor vehicle travel, and that compliance with the Complete Streets mandate remains the rare exception, rather than the rule.**

The chart below shows the budget share averages between the various categories based on their VMT and GHG impacts:

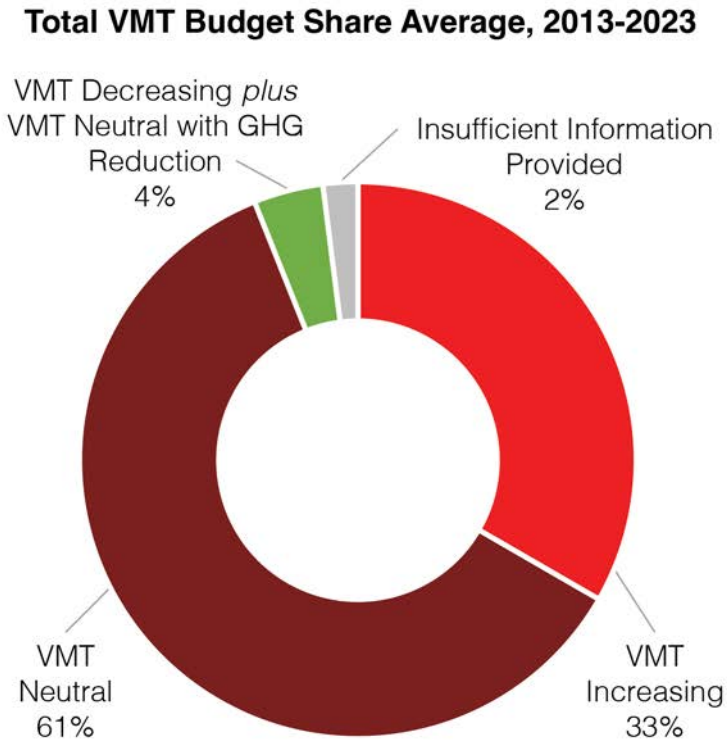


Figure 7. Source: (Attachment 3).

Further, looking at state funds specifically (apart from federal funding), HDOT directed an even greater share of funds toward projects that increase VMT—41%, versus 33% of the combined federal and state funding. This is significant and telling because federal funding can come with conditions potentially limiting HDOT's discretion on how it can spend the funds, but state funding has no such restrictions (and instead should be directly aligned with the State's decarbonization mandates). Thus, the state funding shares provide a more direct indication of HDOT's funding priorities, which actually show an even greater bias toward VMT-increasing projects. The following chart shows the overall breakdown of state funding:

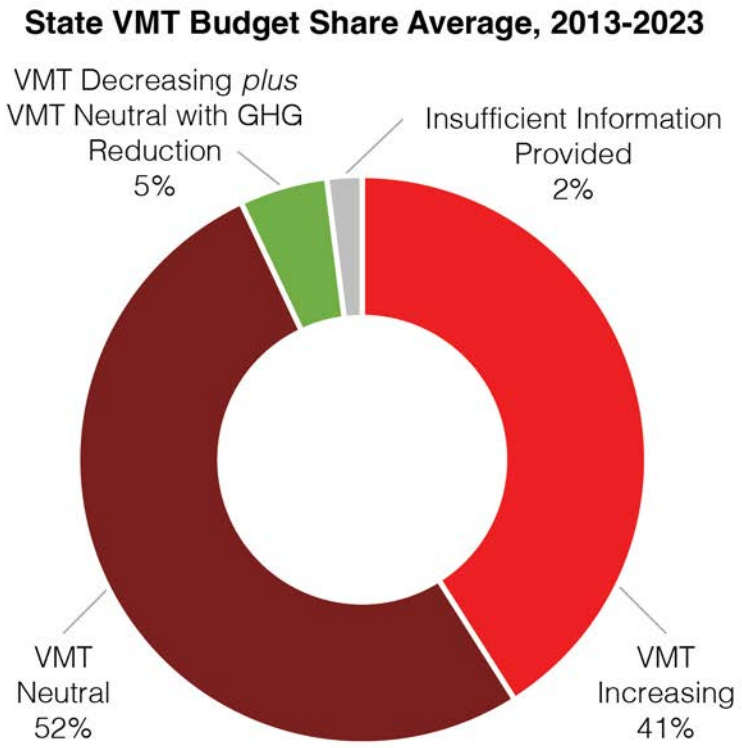


Figure 8. Source: (Attachment 3).

In addition to these findings on the overall budget priorities, I also observed several recent developments of concern. First, in 2019 and 2020, **following the enactment of the ZET in 2018, there was a dramatic spike in budget allocations for VMT-increasing projects, reaching a peak for the 11-year period.** In those years, VMT-increasing projects occupied 56% and 68% of the total budget share, respectively. Most recently, in 2023, only 0.4% of the HDOT's highway infrastructure budget was allocated to projects that reduce VMT ($2.97 million out of $716.02 million).

Also in 2023, the number of projects falling in the unidentifiable "insufficient information" category markedly increased, to 9% of the total list. This effectively blocks any public review of these funding commitments, at a time when public transparency and accountability is more critical than ever, particularly with the massive infusion of federal transportation funding now flowing to HDOT under the federal IIJA. This decline in transparency raises even more concerns given the Legislature's directives requiring more transparent

evaluation and reporting of HDOT's projects; yet the level of transparency in HDOT's budgets has headed in the opposite direction.[20]

Given the urgency of the climate crisis, HDOT needs to dramatically shift this pattern of priorities without delay. It also should reevaluate and redirect projects currently in the funding pipeline before they are built and cause GHG increases for years to come. In 2016, HDOT's *Practical Solutions Action Plan* recommended that "HDOT should establish a formal process to revisit and audit project purpose and need" to determine whether they should remain in the STIP given current priorities—which now expressly include the need to reduce VMT and GHG.

The Climate Commission agrees, recommending that "Projects not yet built that are currently included in the STIP that will increase VMT must be considered for revision or removal in future versions of the STIP if Hawai'i is to reach state and county climate goals." "The next STIP is scheduled for approval by 2025, providing a key opportunity to ensure the new list of projects does not induce increases in VMT and expands transportation choices." (Haw. Climate Comm'n, 2022a).

In sum, my analysis of HDOT's transportation infrastructure budgets confirms what one would expect based on HDOT's historical and ongoing institutional practices. HDOT's transportation funding commitments favor the legacy transportation system that increases emissions and defeats the State's decarbonization mandates.

[20] Transportation experts at the Ulupono Initiative, a Hawai'i-based policy firm, have conducted similar analysis of Hawai'i transportation budgets. In 2021, Ulupono provided the O'ahu MPO with analysis of its proposed TIP, raising concerns that 38.2% of HDOT's requested funding was for new roadway capacity. In particular, $308 million was being proposed for eight roadway projects that would produce an estimated 65 additional million miles of VMT. Of the $308 million, only $12 million or 4% was from federal sources, so these were mostly state funds that could be flexibly used for other, GHG-beneficial purposes. (Rooney, 2021). I note that the 38% figure for VMT-increasing projects from Ulupono's analysis is comparable to the 33 to 41% figures from my 11-year analysis of HDOT's CIP budget. Again, the disparity between these figures and the 4% share of funding for VMT-reducing projects shows the scale of the shift needed to conform the State's transportation funding with its mandates to reduce VMT and GHG and decarbonize the transportation sector.

D. HDOT's Plans, Investments, and Actions for Pedestrian, Bicycle, and Public Transit Networks Limit Transportation Choices and Increase GHG Emissions.

In addition to prioritizing traditional vehicle-centric travel modes, HDOT's transportation program has limited the expansion and growth of alternative transportation choices that reduce GHGs, such as bike, pedestrian, and transit projects. HDOT's historical institutional practices have produced a statewide highway system that provides people with about 177 bikeway miles, 168 sidewalk-path miles, and approximately 9,800 vehicular lane miles (HDOT, 2023e), "signaling that vehicle accessibility outpaces multimodal accessibility." (Haw. Climate Comm'n, 2022a). As one predictable output of this system, in 2021 a super majority (67.2%) of the statewide population in Hawai'i drove alone to work, while only 4.4% walked, 0.8% biked, and 4.9% used transit. Further, since 2013, the number of people who use non-driving modes of transportation has stagnated or eroded, with the percentage of people who drive alone to work increasing about 1.3% per decade. (USA, Hawaii Commuter Transportation).

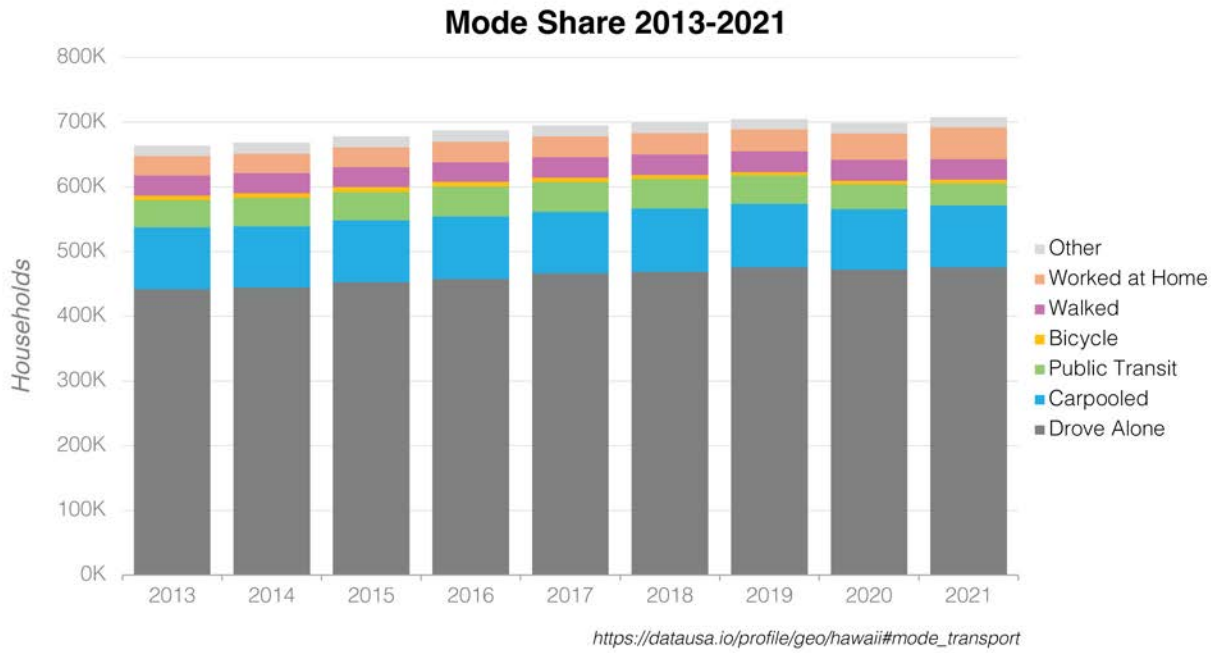


Figure 9. Source: (Data USA, n.d.).

The Hawai'i Legislature has mandated that HDOT "develop and implement a plan for the establishment" of a "contiguous network . . . connecting communities throughout each island" for each of three transportation modes, "in which intersections with other modes . . . shall be minimized." (HRS § 264-142(a)). These networks include:

- "motor vehicle highways," in which "priority and preference for access shall be given to public mass transportation";
- "bicycle and electric bicycle highways or pathways," which "shall be separated and protected from vehicular traffic by physical or natural barriers or by meaningful distance or elevation"; and
- "pedestrian highways or pathways," which also "shall be separated and protected from vehicular traffic by physical or natural barriers or by meaningful distance or elevation."

HDOT must also coordinate with the counties to "develop a comprehensive plan for the establishment" of a "contiguous network of bicycle and pedestrian pathways" connecting public schools and libraries, commercial business and shopping hubs, residential areas, and transportation infrastructure. (HRS § 264-142(b)).

In establishing this mandate, the Legislature emphasized the costs of the legacy "car-centric" transportation system, and the savings and benefits of shifting to other modes such as walking, biking, and transit. This shift "will reduce the cost of living, improve the quality of life for local residents, and stimulate the economy." Instead of spending more money on highway capacity projects, "[t]hose funds could have had a more significant and longer-lasting benefit if they were expended on other issues, such as expanding options for people to commute by public transportation, biking, or walking, especially for those in low-income communities." (Act 131, § 1).

Similarly, the Climate Commission has recommended that HDOT: "Give people in Hawai‘i more safe, affordable, reliable, inviting and convenient choices to get around by funding the completion of our pedestrian, bicycle, transit and green networks." The "Current Situation," however, falls far short: "**There are inadequate multimodal networks to support mode shift**" (emphasis added). The necessary "Next Steps" thus include: "**Prioritize projects that enhance active transportation networks** over new roadway capacity projects, and within multimodal roadway projects, **prioritize pedestrian, bicycle, and transit elements** over vehicle elements"; and "**[C]omplete and fully fund historically underfunded active transportation networks**" (emphasis added). These steps "will provide economic, public health, and environmental dividends for years to come and help Hawai‘i meet its climate and clean energy goals in a resilient and equitable manner." (Haw. Climate Comm'n, 2022a).

The expansion of transportation choices and uses depends on the public infrastructure provided by government, based on the planning and programming implemented by HDOT. Public infrastructure investments channel and drive public choices, whether it is roadway capacity expansions that produce more VMT, or investments in expanded options that reduce VMT. To enable and encourage a shift to non-vehicular modes, people need (and want) complete and connected networks, safety, convenience, and comfort. The Legislature recognized this in establishing Act 131. The Climate Commission also recognizes this principle that "[r]oad capacity expansion projects induce new VMT by making it easier to drive more, **whereas pedestrian, bicycle, and transit projects reduce VMT by making it easier to drive less**" (emphasis added). Thus, "[a] robust, equitable, and interconnected active transportation network that includes greenways, where residents and visitors can safely and comfortably make the choice to walk, roll, ride a bike, or take transit for all or many of their daily needs is **essential to achieving VMT reductions and making progress towards climate goals**." (Haw. Climate Comm'n, 2022a) (emphasis added).

As the Smart Growth America-sponsored *Drivers of VMT* report found, about 30% of trips in Hawai'i are under one mile, and about 60% are under three miles; moreover, up to 20% of total VMT is for trips under five miles, and about 30% is for trips under 10 miles. Hawai'i's geography thus presents prime opportunities for shifting to other modes under the right investments and priorities. (SSTI, 2021). This shift will not occur, however, under HDOT's current vehicle-centric legacy system.

In my experience with the NYC DOT, I saw how the agency's commitment to stop expanding highways and instead convert road space to protected bike lanes, bus lanes, wider sidewalks, and plazas increased the city's sustainable mode share (trips by walking, cycling, and transit) to 65% today, an almost 10% increase from levels in the 1980s and 90s. Further, in 2018, the NYC DOT adopted an 80% sustainable mode share goal as part of its climate action plan and reaffirmed that goal in the City's 2023 sustainability plan. HDOT, in contrast, has not established any such objectives and targets for expanding the share of trips made by walking, cycling, public transit, and other shared modes and has not prioritized and invested in building out the State's mandated pedestrian, bicycle, and transit networks.

1. *HDOT Has Left the Statewide Pedestrian Infrastructure Vastly Unfunded and Undeveloped for Decades.*

HDOT's pedestrian infrastructure planning includes the *Statewide Pedestrian Master Plan* (2013b) and *Hawai'i Pedestrian Toolbox* (2013c). As the Toolbox correctly recognizes, "If more people walk and use other forms of transportation besides motor vehicles for their trips in Hawai'i, less greenhouse gas emissions will occur, reducing the potential effects of climate change." Yet, HDOT does not match this recognition of GHG benefits with actual progress in achieving them.

First, HDOT is installing pedestrian infrastructure at a glacial pace. The 2013 Pedestrian Master Plan identified 31 "prioritized" projects statewide. More than 10 years later, only 15 have been funded and implemented. (Defs.' Answer to Interrog. 24). Of the 16 projects not yet implemented, HDOT has only budgeted to complete three of them in the next five years. (Defs.' Answer to Interrog. 26). In other words, HDOT has taken more than a decade to implement less than half of the projects in its Pedestrian Master Plan. It is unknown when the Pedestrian Master Plan will be fully implemented.[21]

The actual miles of pedestrian installations show a similar picture. HDOT only started tracking and reporting statewide pedestrian facilities in 2019. (Defs.' Resp. to Req. for Produc. No. 44). Between 2019 and 2023, HDOT added only about 10 miles of sidewalk paths in the State—compared to an increase of 54.5 statewide lane mileage between 2019 and 2022, more than a 5x difference (Figure 10). (STPO, 2016; HDOT, RFP 46(ii); HDOT, 2023e).

Figure 10. Miles of sidewalk paths for years 2019 to 2022. (HDOT, Sidewalk Path Miles; HDOT, Red-PM-Facility Chart)

[21] Ulupono Initiative commented on the draft HSTP, requesting that HDOT add language that it would complete implementation of the priorities from the Statewide Pedestrian Master Plan. (Ulupono Initiative, 2023). In response, HDOT simply stated it would keep the language that it would "continue to implement." (HDOT, 2023f).

HDOT reports that the number of crosswalks for pedestrian access in the state has not changed from 2019 to 2023 and remains at 2,052 (Figure 11). (HDOT, Ped-PM-Facility_Chart). Just looking at O‘ahu as an example, there are 901 “missing walkways” in the pedestrian network for the City and County of Honolulu alone, and 36.2% of O‘ahu roads do not have any walkways at all. (City & County of Honolulu, 2022). Figure 11 shows the historically slow progress for pedestrian infrastructure.

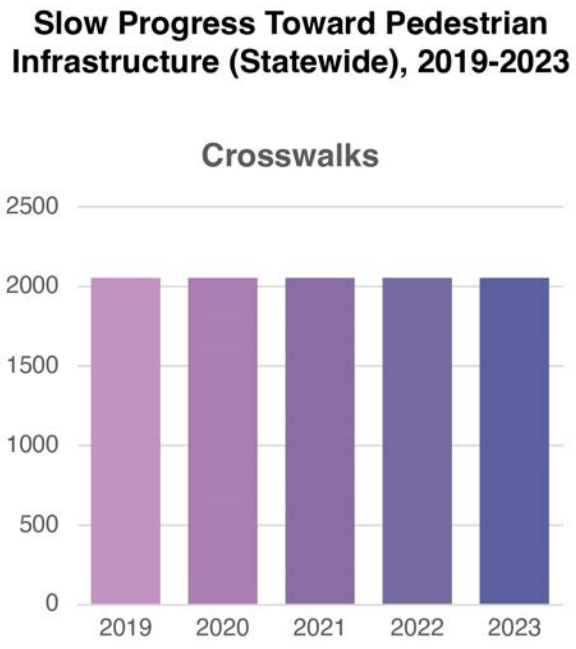


Figure 11. Number of crosswalks for years 2019-2022. Source Facility Chart)

Second, HDOT has demonstrated an inability to prioritize and invest in pedestrian safety, which imposes a barrier and hazard to increased pedestrian use. Although HDOT has recognized the safety benefits of raised crosswalks,[22] the share of raised crosswalks remains minimal, at only 3.9% of all crossings.

Third, HDOT’s funding of pedestrian infrastructure lags far behind its investments projects that exacerbate GHG emissions. Similarly, HDOT reported that its total capital budget for the Highways Division in 2023 was $218,014,000, of which it spent around $11 million—only about 5%—on pedestrian infrastructure (HDOT, 2023e).[23] For comparison, the City and County of Honolulu estimates that providing the missing walkways on O‘ahu alone will cost $2.6 billion. (City & County of Honolulu, 2022). This gap of orders of

[22] Raised crosswalks reduce pedestrian crashes by 45%. (U.S. DOT, Agencies Design Raised Crosswalks). There has been zero pedestrian fatalities at the locations where raised crosswalks were installed, and “[i]nitial speed analysis demonstrates a potential decrease in speeding by up to 50 percent.” (HDOT, 2023e).

[23] The multimodal section of HDOT’s 2023 Act 100 report cites a figure of $11,147,719 for pedestrian facilities, but the main section of the report, under “Expenditures Breakdown” (HDOT, 2023d), cites a smaller figure of $10,235,733 for **all** multimodal projects, not just pedestrian facilities. The reason for this discrepancy is unclear, but either way, HDOT is dedicating only a tiny percentage of its budget to multimodal projects.

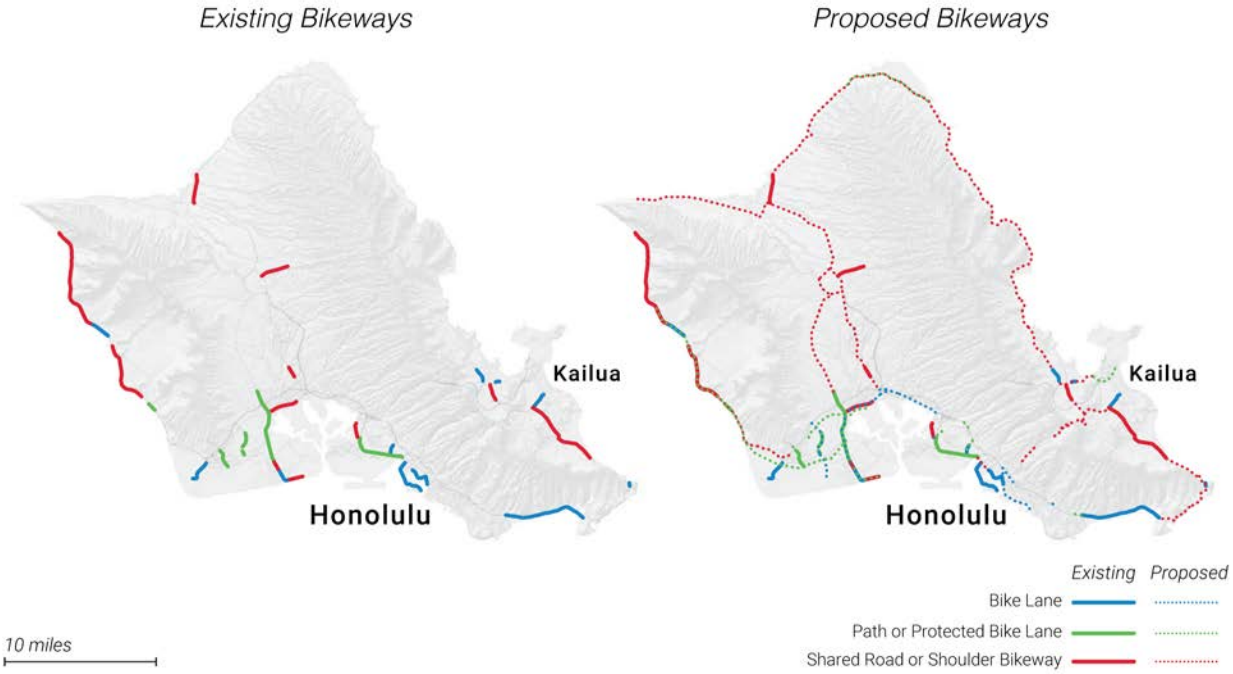
magnitude between HDOT's pedestrian infrastructure budget and overall statewide needs highlights the level of disconnect between HDOT's priorities and its mandate to establish a connected network of pedestrian pathways. (HRS § 264-142(a)(3)). Pedestrian infrastructure not only decreases GHG emissions and protects the children in this case from climate harms, but also provides safer and healthier pedestrian modes of transit with significant co-benefits for children, including these plaintiffs.

2. *HDOT Has Deprioritized the Statewide Bicycle Infrastructure for Decades and Will Leave the Network Vastly Incomplete.*

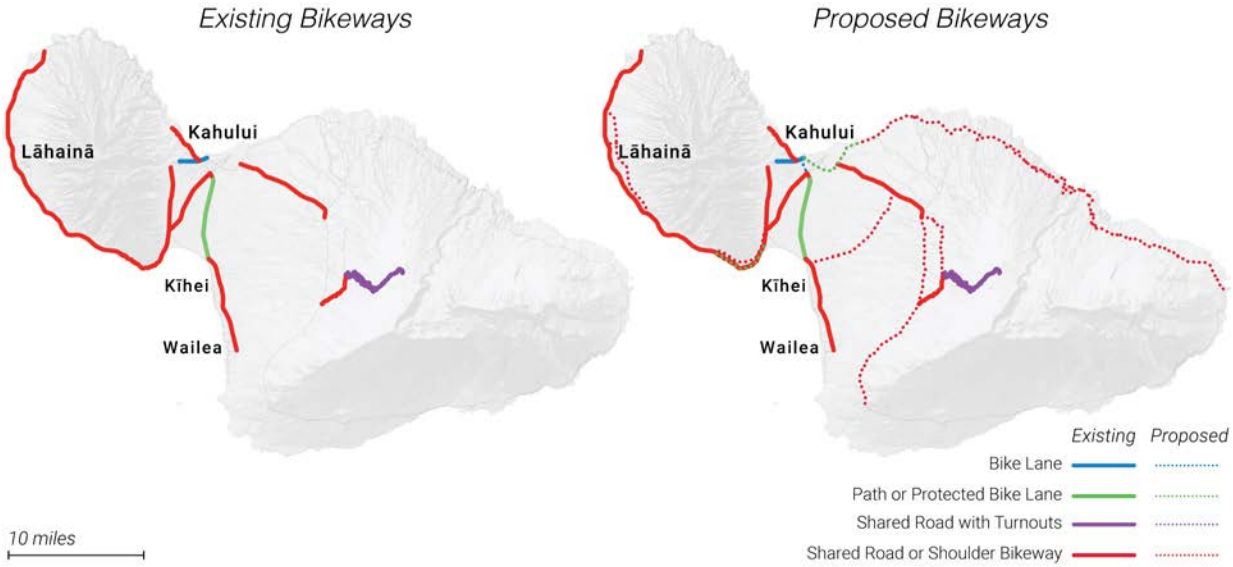
"Increasing a community's bicycle mode share reduces combustion engine vehicle miles traveled (VMT), which reduces greenhouse gas emissions that contribute to climate change." (City & County of Honolulu, 2019). HDOT's planning document for bicycle infrastructure is the *Bike Plan Hawai'i Refresh* (HDOT, 2022f), which updated the 2003 Bike Plan. HDOT's own data[24] show it is not planning or implementing a "contiguous network of bicycle and electric bicycle highways or pathways connecting communities throughout each island," but rather is perpetuating a highly fragmented and inaccessible system on every island. Further, HDOT's bicycle projects have heavily favored the addition of unsafe and unconducive "bike shoulders," which are basically bikeways painted onto existing road shoulders, instead of the mandated paths "separated and protected from vehicular traffic by physical or natural barriers or by meaningful distance or elevation." (HRS § 264-142(a)(2)).

[24] HDOT has not consistently tracked its bicycle facilities inventory and has data only for years 2003, 2013, and 2020-22. (Defs.' Resp. to Req. for Produc. No. 43).

Existing and Proposed Bikeways – O‘ahu



Existing and Proposed Bikeways – Maui



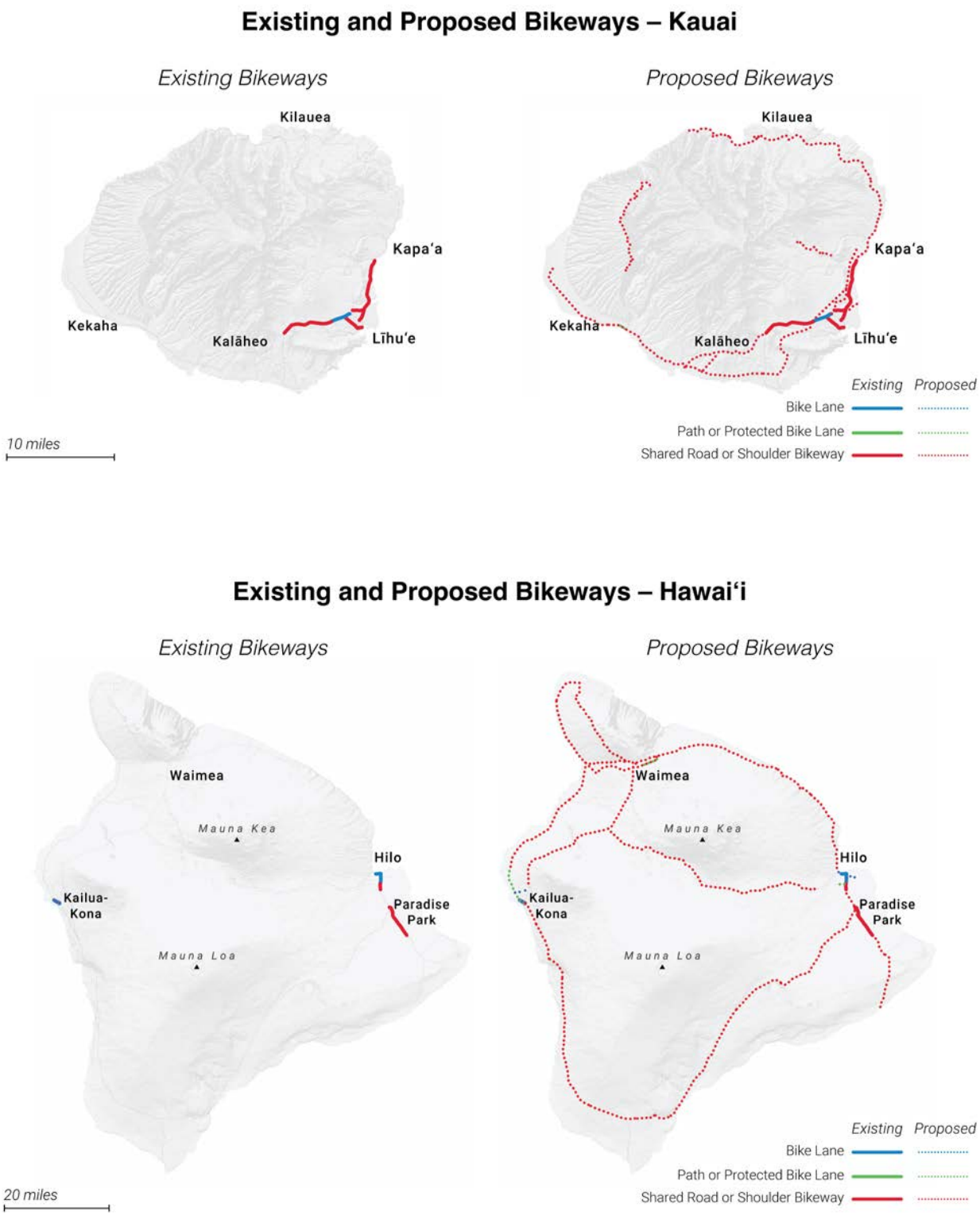


Figure 12. Existing and Proposed Bikeways. Source: (Bike Plan Hawaii Refresh: Bikeway Maps, 2022).

The State's Bike Plan, originally prepared in 1977 and updated in 1994 and 2003, "recommends the addition of approximately 1,722 miles of new bikeways to the statewide network (compared to 1,309 new miles in the 1994 plan)," which it states would improve "connectivity between existing and proposed facilities." But as of 2022, when the plan was "refreshed," there were only "174 miles of existing bikeways on the state highway system"—or only about 10% of the recommended bikeways. As shown in the following graph, in almost two decades, HDOT has added only 75 miles of bikeways. (HDOT, 2003; HDOT, 2022f).

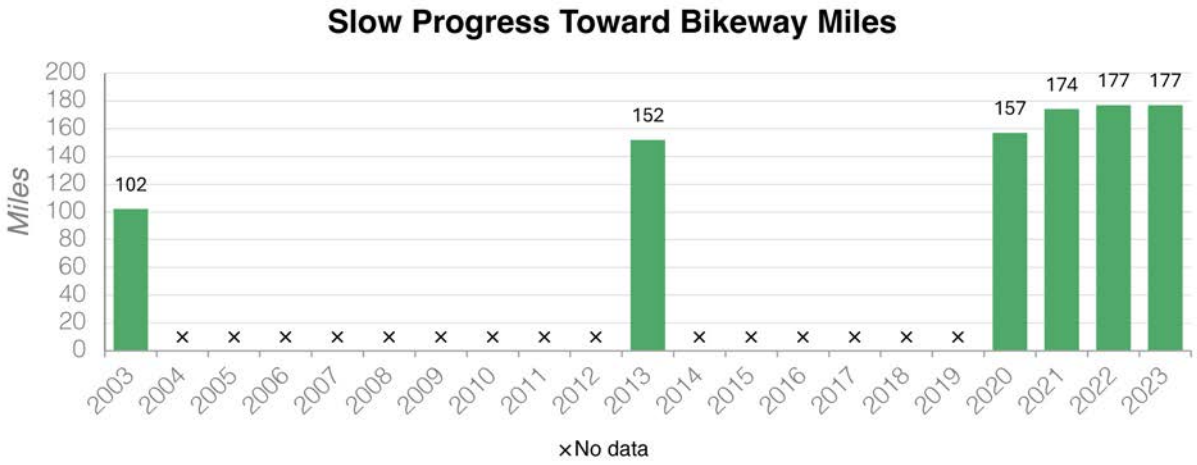


Figure 13. Number of bikeway miles on the State DOT system since 2003. Source: (HDOT, Bicycle Planning; HDOT 2022f).

In contrast to the 1,722 bikeway miles proposed in the 2003 Bike Plan, the Bike Plan Refresh provides a map with 792 proposed miles. Yet, the Bike Plan Refresh proposes an implementation plan that would end up with a total of only 121 miles of bike facilities in the next 5 to 10 years and 296 bikeway miles on the state highway system in the next 10 to 25 years, which would amount to only about 17% of what HDOT recommended in 2003.[25] (HDOT 2003; HDOT, 2022f; Defs' Response to Interrog. No. 26).

The planned long-term horizon of 10 to 25 years for implementation of 296 bikeway miles, which is only 37% of what HDOT stated is needed based on the 792 miles in the Bike Plan Refresh, extends to 2049. HDOT's implementation of this plan is not aligned with the mandates to complete the bikeway networks and decarbonize the transportation system.

[25] In the Bike Plan Refresh, projects listed in the "Estimated New Miles" column are intended to be implemented in the near-term of 5 to 10 years, and projects listed in the "Estimated Future Miles" column are intended to be implemented in the mid- to long-term of 10 to 25 years. (Roper-Noonan Tr. 123:11-124:2).

According to HDOT's Act 100 report, bicycle expenditures in 2023 amounted to about $18 million.[26] For comparison, the City & County of Honolulu's 2019 Bike Plan Update indicates that, to complete just the "Priority 1" bikeway projects for O'ahu, which amount to 103 miles, the State's projected share of the costs would be $56.9 million. (City & County of Honolulu's, 2019). This initial installment of bicycle infrastructure for O'ahu alone is three times the amount that HDOT spent across all the islands in 2023.

The Climate Commission emphasizes that "Prioritizing investments in projects that improve the safety of people walking and biking is needed to see a reduction in single occupancy vehicles and VMT." (Haw. Climate Comm'n, 2022a). However, in its funding of bike facilities, HDOT predominantly prioritizes "shoulder bikeways" painted onto existing road shoulders. Such pathways are the least safe and accessible option for bicycles and do not meet the requirement of pathways "separated and protected from vehicular traffic." (HRS § 264-142(b); HDOT, 2022c).

As part of the Bike Plan Refresh, HDOT collected data on the public's level of comfort with each of the bikeways shown in the chart below. Members of the public ranked shared-use paths as the most comfortable and shoulder bikeways as the least comfortable, which makes sense since shoulder bikeways leave users directly exposed to adjacent vehicular traffic.

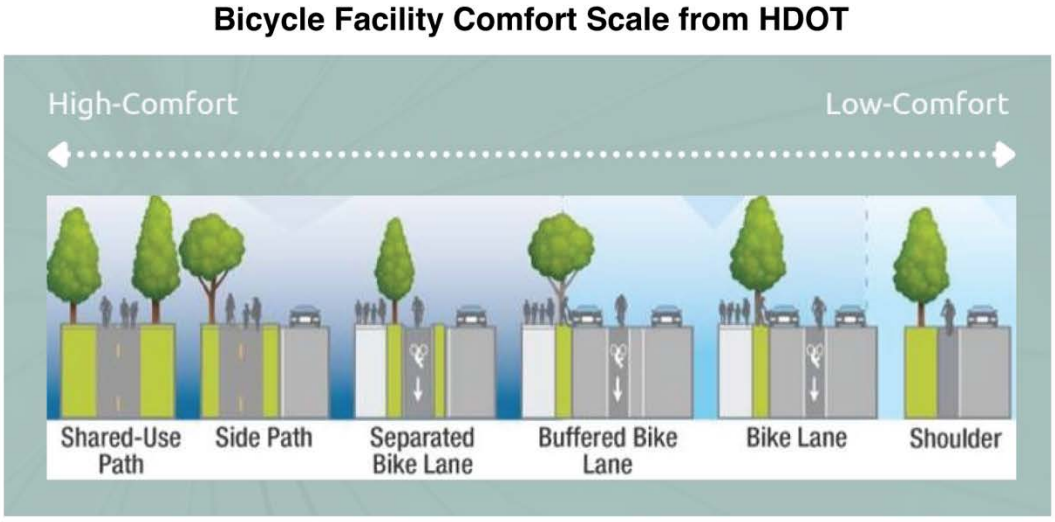


Figure 14. Source: (HDOT, 2022g).

[26] Again, HDOT's Act 100 report cites a figure of $18,399,725 figure for bike facilities, but also cites a significantly smaller number of $10,235,733 for all multimodal projects.

For the last two decades, however, HDOT has added very few protected bike paths and bike lanes, but instead has overwhelmingly prioritized road shoulders as a way to add bike routes. Of the 10 planned bike facilities, amounting to 41 miles of new bikeways, that HDOT budgeted for the next five years, HDOT continues to predominantly prioritize shoulder bikeways: six are shoulder bikeways, two are bike lanes, and two are described as either a path or a shared use path. (Defs.' Answer to Interrog. 26). Thus, even among the limited number of bikeways that HDOT is proposing, it is planning to build 37 out of the 41 miles as facilities in the form that is the least safe and accommodating for users, which will discourage usage and limit the VMT and GHG reduction benefits. HDOT's overreliance on shoulders does not fulfill the need and purpose to establish a bona fide, protected bicycle and electric bicycle network to support the State's decarbonization mandates.

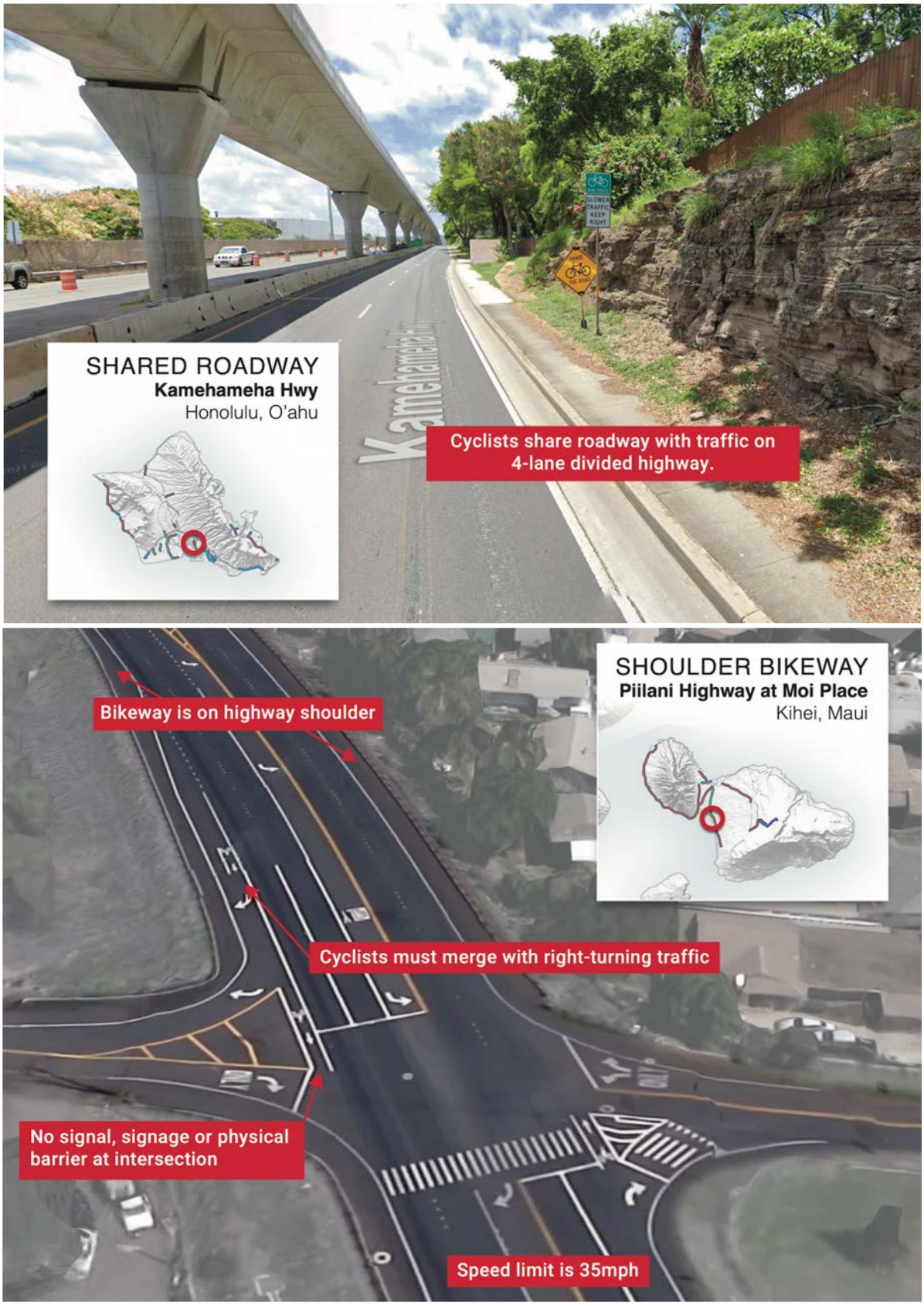

SHARED ROADWAY
Kamehameha Hwy
Honolulu, O'ahu
Cyclists share roadway with traffic on 4-lane divided highway.
SHOULDER BIKEWAY
Piilani Highway at Moi Place
Kihei, Maui
Bikeway is on highway shoulder
Cyclists must merge with right-turning traffic
No signal, signage or physical barrier at intersection
Speed limit is 35mph

Figure 15.

Based on my experience working in and observing other cities and states across the U.S. and the world, HDOT's current rate and form of investment in cycling infrastructure will not meaningfully increase the share of trips by bicycle by 2045, and therefore, will not meaningfully reduce GHG emissions. If HDOT, however, were to build and retrofit the 792 miles of bikeways in the Bike Plan Refresh as protected bike lanes, side paths, or shared use lanes with appropriate widths to accommodate potential demand, and stopped encouraging car dependence, it would begin to measurably boost the share of trips by bicycle in the span of a few years, as has happened in places like the Netherlands, Denmark, Germany, Japan, Bogota, and New York City.[27] New York City, for example, nearly doubled the number of daily cyclists between 2012 and 2022, as it grew its protected bike lane network to 644 lane-miles. If HDOT were to take such actions, it could dramatically improve cyclist safety, cut VMT, and reduce GHGs. With significantly improved investments in the quantity and type of infrastructure and the right incentives, in my opinion, bicycling trips (including electric bike, scooter, and other micromobility trips) could account for 10 or more percent of all trips in the state by 2045. As with sidewalks discussed above, bike lanes protect the children in this case by providing for safer modes of transit for people who cannot drive cars, in addition to reducing the GHG pollution that affects these children locally in causing climate change.

3. HDOT Has Ignored the Collapse in Public Transit Ridership.

Public transit also "offers a low emissions alternative to driving" that enables "significant [GHG] emissions savings." For example, U.S. bus transit, with about a quarter (28%) of its seats occupied on average, emits an estimated 33% lower GHG per mile than the average U.S. single-occupancy vehicle. (FTA, 2010). This GHG benefit, of course, increases with more ridership and as more buses convert to hybrid or full electric power. For almost a decade, however, the State of Hawai'i has been undergoing a critical collapse in public transit ridership that impairs its ability to achieve its transportation decarbonization goals, and HDOT has not meaningfully responded to the collapse.

While the counties operate public transit in Hawai'i, HDOT plays a key role in this area as the lead agency responsible for planning and funding the statewide transportation system. Since less public transit usage means increased reliance and pressure on the traditional default mode of single occupancy vehicles (and

[27] (Thomas, 2023; Fleming, 2018; Bike City, 2022; Marsal, 2021; NYC DOT, 2021b; NYC DOT, n.d.).

vice versa), HDOT has a direct interest in this transportation mode as much as any of the others. In its draft HSTP, HDOT claims that it "provides critical support and assistance to county transit systems, and transit systems in turn provide critical transportation services to Hawai'i's residents and visitors." (HDOT, 2022a). Yet, here as well, HDOT has not been taking the necessary active leadership to promote VMT and GHG reductions.

In the HSTP (2022a), HDOT reports drastic declines in bus ridership statewide over the past decade, by as much as 50 to 70 percent. For example:

- On O'ahu, TheBus and TheHandi-Van declined from almost 70 million annual passenger trips in 2015, to 65 million in 2019, to 50 million in 2020, and 28 million in 2021.
- The Maui Bus declined from 2.4 million passenger trips in 2015, to 2 million in 2019, 1.6 million in 2020, and 925,000 in 2021.
- Hawai'i Island's Hele-On ridership declined from 1.1 million passenger trips in 2015, to 665,000 in 2019, 560,000 in 2020, and 325,000 in 2021.
- Kaua'i Bus ridership declined from 875,000 in 2015, to 760,000 in 2019, 645,000 in 2020, and 408,000 in 2021.

Figure 17, below, shows the collapse in transit ridership in O'ahu over the decade between 2009 to 2022—before the pandemic occurred.

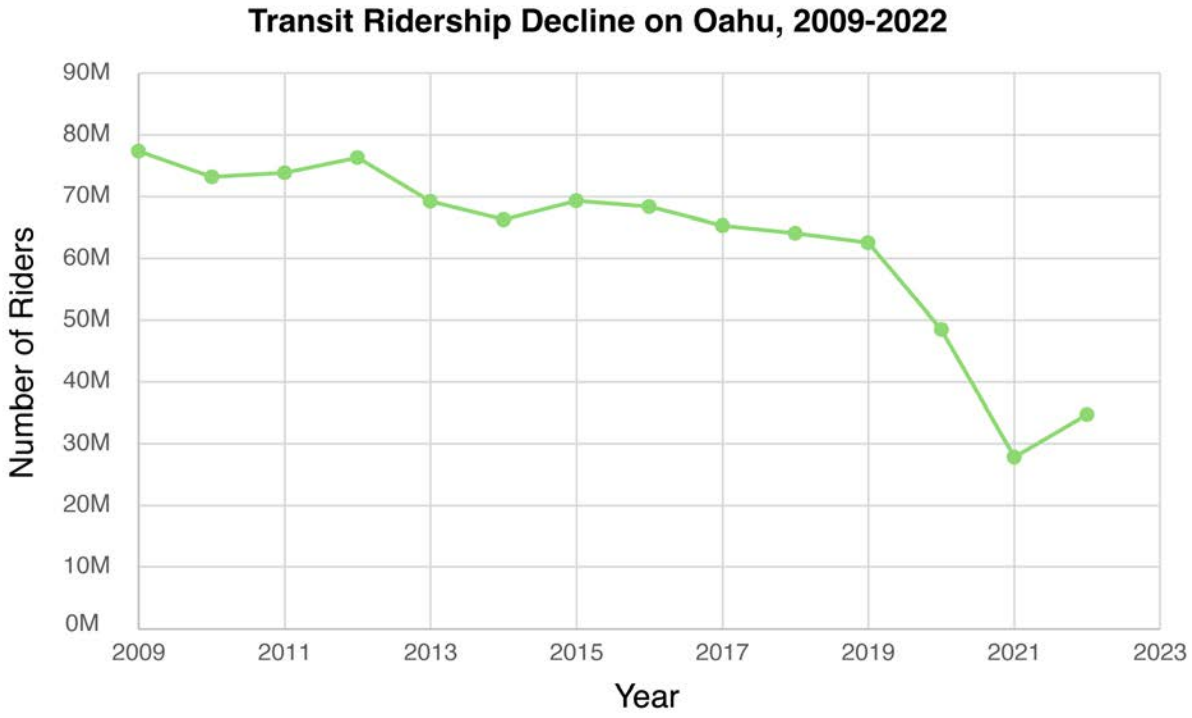


Figure 16. Source: (DBEDT, 2022).

While the COVID pandemic certainly contributed, these declines in public transit use also predated the pandemic by many years and have persisted long after the height of the pandemic. The declines in Hawai‘i extend back much longer and cut much deeper than the trends across the nation since the pandemic, where the national average now stands at 77% of pre-pandemic levels (a 23% deficit). (American Public Transportation Association, 2023).

In my experience working in a DOT, this level of collapse in statewide public transportation in Hawai‘i would qualify as a true crisis, demanding urgent attention and action by any and all responsible agencies. It should particularly concern HDOT since the decline is occurring across all the islands in the State and is headed in the opposite direction of what is needed to address the State's recognized climate emergency.

HDOT, however, has no plan or program to address this collapse in transit ridership and redirect it in line with the State's decarbonization mandates. Instead, in the limited mentions in HDOT's plans and reports that I have seen, HDOT has maintained a generally passive or cavalier mindset toward this crisis.

In its draft HSTP, for example, HDOT merely notes in passing the declines in transit ridership on each island, describing the over-50% drop in ridership on Kaua‘i since 2015 as "declined slightly." (HDOT, 2022a). It offers no concern about this crisis; no inquiry or analysis into its causes and impacts on the transportation system; and no vision and plan for not only arresting the decline, but rapidly reversing in the other direction to support Hawai‘i's VMT and GHG reduction mandates. While HDOT recently directed some unused leftover federal funds to the counties for transit at their request (HDOT Tr. 38:4-40:11), HDOT officials repeatedly maintained that the agency otherwise has no plans or programs to increase transit ridership and is not aware of any efforts; does not coordinate with the counties and is not aware of specific discussions; and is generally not involved. (Shishido Tr. 80:9-13; Dill Tr. 62:20-63:13, 109:5-7; Takiue Tr. 52:23-53:8).

To meet the decline in bus use across Hawai‘i, HDOT should be building its roadway network so that "priority and preference for access shall be given to public mass transportation." (HRS § 264-142(a)). Established best practices for providing such priority and preference include reserved bus lanes, queue jumper lanes, and signal preemption. Along these lines, the City and County of Honolulu recently installed a designated bus-only lane on King Street under an expedited pilot process, which was praised as a model for "climate-friendly transportation."

(Stampe, 2020). HDOT should be moving to plan and scale these and other improvements across the entire state.

Bus Rapid Transit is also an effective solution especially for high-volume corridors, where center-running bus lanes, limits on left turns, separate stations for buses, and off-board fare collection can transform buses into a high-speed and high-capacity transit option very cost-effectively. HDOT should also be leading the way to improve walk and bike access to transit stops; install secure bike parking at stops and connected protected bike lanes and sidewalks between stops and nearby activity centers; and expand options beyond massive park-and-ride lots at rail stations. In other words, needs and opportunities abound for HDOT, as the State's head transportation agency, to promote public transit and its VMT and GHG reduction benefits, should it meet this responsibility.

In sum, the crisis of public transit that has been unfolding in Hawai‘i for years should have raised alarms for the State as to its detrimental impacts on the need to reduce VMT and GHG. But HDOT has not recognized this urgency or fulfilled its leadership role for the State in addressing this key avenue for transportation decarbonization.

4. HDOT Fundamentally Undermines the Complete Streets Mandate.

HDOT's responsibility to enable all multimodal options is not a new requirement. Fifteen years ago, the Legislature enacted the Complete Streets mandate for Hawai‘i. Complete Streets is a widely established best practice, akin to a "Magna Carta" for the modern multimodal model of transportation. It mandates HDOT to "reasonably accommodate convenient access and mobility for all users of the public highways… including pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities." (HRS § 264-20.5(a)). Under best practices, Complete Streets should also emphasize the needs of people and communities who have been underserved and overburdened by the traditional vehicle-centric transportation model.

This era of climate emergency presents a heightened opportunity for the State and HDOT to realize the full promise of Complete Streets in giving the people of Hawai‘i a “robust, equitable and interconnected active transportation network,” which is “essential to achieving VMT reductions and making progress towards climate goals.” (Haw. Climate Comm’n, 2022a). Based on HDOT’s practices and its actual performance in prioritizing and promoting multimodal options, however, the Complete Streets mandate remains largely unfulfilled and insufficient to fulfill Hawai‘i’s climate mandates.

Figure 17. Source: (Replogle, 2023).

The Complete Streets requirement “shall apply to new construction, reconstruction, and maintenance of highways, roads, streets, ways, and lanes located within urban, suburban, and rural areas, if appropriate for the application of complete streets.” (HRS § 264-20.5(b)). As HDOT’s adopted Complete Streets procedures recognize, it applies to “[a]ll public highways, roadways, and streets statewide,” and in “[a]ll planning efforts and project alternatives, as well as development, capital improvement projects, operations, and maintenance.” (HDOT, 2022h). In other words, HDOT is “require[d] at any time we touch a system, we upgrade it for all modes of transportation relevant to its classification.” (HDOT Tr. 195:3-5).

In its ongoing practice, however, HDOT relegates Complete Streets to an afterthought to its traditional system focused on capacity expansion. As the Climate Commission found, “Current state and county transportation needs identification and project development processes tend to **prioritize and design for vehicle movements** while facility improvements for **non-motorized modes tend to be considered in later phases of project development**.” Instead, HDOT needs to “Consider **all user needs** on State and county facilities and prioritize people walking, biking, and taking transit **early in project development**.” (Haw. Climate Comm’n, 2022a) (emphases added).

HDOT confirms that, for its capacity program, "we don't look at complete streets for that program. We let them take care of it in the project level. So it's not a criteria that we use for capacity." (Tatsuguchi Tr. 149:9-12). Complete streets are considered when the capacity project "gets to the project delivery phase," but not when it "gets budgeted and programmed." Rather, "**it's assumed it will be taken care of when they go to the next step**." (Tatsuguchi Tr. 149:18-25) (emphasis added). This is exactly the problem that the Climate Commission highlighted. It shows how legacy practices prioritize projects that increase VMT and GHG; subordinate other transportation needs to secondary consideration for potential later add-ons; and ultimately circumvent the Complete Streets mandate.

Further, as discussed above, adding a multimodal component as an extra layer on top of a vehicle capacity expansion project does nothing to ameliorate the underlying VMT increases that the project causes. Rather, the science establishes that capacity expansions lead to VMT increases, and thus GHG emissions, which concurrent multimodal expansions do not counteract. Additional work and intervention then become necessary to undo the GHG impacts of the capacity expansion.

HDOT's *Practical Solutions Action Plan* reported in 2016 that "staff still generally struggles with how to implement [Complete Streets] at the project level" and maintained that a "Complete Streets approach is not reactive. In other words, a transportation agency would not wait for a separate planning effort to prioritize a corridor for bicycles and pedestrians." Yet, eight years later, HDOT still conveys the same struggles.

The Complete Streets mandate exempts certain situations where full accommodations are prohibited or unsafe, there is no future need, or "costs would be excessively disproportionate to the need or probable use." (HRS § 264-20.5(c)). Although HDOT's *Practical Solutions Action Plan* recommended that HDOT "[c]reate or adopt a Complete Streets guide" including design standards and performance measures, HDOT has no written guidance or transparent criteria for determining whether any of the exemptions apply to a project. (Roper-Noonan Tr. 155:3-10). HDOT also does not consider climate change and costs when determining whether the "excessively disproportionate cost" exception applies. (Shishido Tr. 160:4-14; Roper-Noonan Tr. 156:11-21).

HDOT's Complete Streets procedures require that HDOT "**will include** bicycle, pedestrian, and other multimodal improvements with projects ('plus up' the system) **unless there is a documented exception**" (emphasis added). "The evaluation process will be **transparent** and decisions **documented**," and HDOT

"**will maintain a list of projects to track exceptions** and project data" (emphasis added). HDOT, however, does not maintain such a list. (Defs' Resp. to Req. for Produc. No. 73).

HDOT's *Practical Solutions Action Plan* emphasizes: **"The bottom line is that HDOT should document reasons for failing to design all users into open access roadways, not require users to justify their safe accommodation"** (emphasis added). Yet, HDOT does not document and disclose to the public how often it invokes exceptions to the Complete Streets policy. (HDOT Tr. 197:19). Instead, HDOT claims that exceptions are sometimes, but not always, documented in individual project files. (Dill Tr. 81:1-18, 157:25-158:12). According to HDOT's reports, in 2023, only 35% of active projects have a bicycle and/or pedestrian improvement component, while 65% do not. (HDOT, 2023d). But what HDOT does not inform the public is why, and on what basis. This lack of transparency and accountability on Complete Streets fundamentally undermines this mandate.

HDOT's disregard of the Complete Streets mandate undermines not only the State's VMT and GHG reduction priorities, but also the closely interrelated priority at the heart of Complete Streets: **safety for all users, including those most vulnerable like pedestrians and cyclists**. The Legislature found in Act 131 that the legacy transportation system has produced "some of the highest transportation-related fatality rates in the nation," in which "drivers are more likely to strike and kill pedestrians in low-income neighborhoods than in high-income neighborhoods due to a lack of infrastructure." Act 131 thus sought to "modernize Hawai'i's ground transportation infrastructure" and "move Hawai'i forward into the twenty-first century" by fulfilling parallel purposes including: "Minimizing injuries and fatalities" and "Addressing greenhouse gas emissions."

Based on my experience, including my work with NYC DOT, it is clear that HDOT must establish a new, comprehensive systems approach that fully integrates both the safety of vulnerable users and VMT and GHG reduction as top priorities. In 2014, NYC DOT was the first in the nation to adopt "Vision Zero," a commitment to eliminate all traffic fatalities. And it has continued this commitment as a recognized key part of its plan to become carbon neutral. As an example of one of its most ambitious and successful projects, the DOT has worked to redesign Queens Boulevard—a major car-dominated roadway spanning up to 300-feet and 10 lanes and known as the "Boulevard of Death" for its notorious history of 186 people being killed on it between 1990 and 2017—to incorporate more crosswalks, widened medians with trees and benches, bike

lanes, walking paths, and speed protections (see, e.g., Figure 18 above). As a result, pedestrian and cyclist deaths on the road dropped to zero. (Hu, 2017).

In 2019, the Hawai‘i Legislature also adopted Vision Zero, finding that "[i]n 2018, a record number of forty-three pedestrian fatalities were documented in Hawai‘i, reflecting a dramatic increase from fifteen in 2017." The Legislature intended that "Vision Zero strategies can be easily integrated into existing Complete Streets programs." (HRS § 286-7.5; Act 134, 2019). Yet, as a direct consequence of HDOT not fulfilling the Complete Streets mandate, deaths of vulnerable users continue. Based on HDOT's reported statistics, pedestrian and cyclist fatalities continue to hover around historical levels (with scooter fatalities also now starting to show up in the statistics). (HDOT, 2023g) (HDOT, Improve Safety). And hand-in-hand with these deaths, VMT and GHG from the transportation system and current and future harms from climate change continue to rise.

In sum, HDOT's practice and performance show how its traditional transportation agency approach diminishes Complete Streets from a mandate to establish a new model into an opaque process that maintains and accommodates the status quo. HDOT's treatment of Complete Streets promotes projects and an overall program that increases VMT and GHG, contrary to Hawai‘i's decarbonization mandates.

E. HDOT's Current Activities to Address Climate Mitigation Are Piecemeal Rather than Transformative.

In response to questions in discovery that I have reviewed, HDOT has listed a handful of individual activities or "initiatives" it has taken to reduce GHG emissions.[28] (Defs.' Response to Interrog. Nos. 5, 6, 7). In my expert opinion, while these individual activities can be minimally beneficial within their own discrete and limited scope, they demonstrate the fundamental problem with HDOT's approach to transportation decarbonization—namely, that HDOT remains focused on ad hoc, piecemeal measures at the margins, rather than

[28] The activities HDOT listed as action it is taking to reduce GHG emissions include: an energy performance contract, electrification of HDOT's own fleet, use of a carbon injected concrete mix, funding toward construction of a plastic recycling facility, allowing EVs in the high occupancy vehicle lanes, an electric bus demonstration, hosting a Sustainable Transportation forum from 2016-2018, sponsorship of the Port Infrastructure Development Program application at Kapalama Container Terminal, the LRTP, Bike Plan, Pedestrian Master Plan and Toolbox, Act 100 Reports, and the Act 222 Annual Bicycle Expenditures Report.

systems-level transformation at the scale and pace necessary to meet the State's declared "climate emergency" and established decarbonization mandates.

Most of HDOT's listed accomplishments focus only on its own facilities (e.g., its energy performance contract with an outside vendor to increase energy efficiency) and its own fleet (e.g., its procurement of electric vehicles). HDOT does not appear to have any idea or aspiration for how any of these activities may be rapidly scalable to achieve rapid sector-wide progress on reducing GHG.

This patchwork of activities is not informed by any analysis or reporting on how much GHG reductions are actually achieved by each activity and as a whole. (HDOT Tr. 31:14-21, 32:19-23, 81:8-10, 82:14-25, 91:17-92:10, 95:6-11, 132:3-6, 233:23-234:2). It is not organized under any unified and holistic plan or program. (HDOT Tr. 64:21-23). And most fundamentally, it does not address reducing GHG at the **systems** level, where HDOT holds "the greatest opportunity to reduce transportation GHG emissions" and transition the legacy system to the transportation system of the 21st century that a climate-safe world for these children requires. In focusing on its own facilities and fleet, for example, HDOT fixes its sights on only the narrowest possible portion of transportation sector emissions, typically a mere fraction of a percent of total emissions. (NCHRP, 2022a).

In sum, the scattered nature of HDOT's activities to reduce GHG should raise grave alarms for the State's ability to meet its decarbonization mandates. Yet, this breakdown in government response is a function and consequence of HDOT lacking a comprehensive performance framework, plan, and program for reducing GHG emissions from the state transportation system, as detailed above. So long as HDOT treats GHG mitigation as an ancillary consideration and limits its scope to the agency's own internal activities—rather than establishing it as a core part of its governmental mission of planning, building, and administering the State's transportation system—HDOT and the State will remain off track from the direction needed to decarbonize the transportation sector.

4. Conclusion

It is now 2024—the halfway point between the enactment of the ZET in 2018 and the 50% emissions limit in 2030. Based on my review of all the information as discussed above and my professional experience and expertise, including an entire career of working with and within transportation agencies and

as a DOT administrator myself, I conclude that HDOT's planning, implementation, and management of the state transportation system is perpetuating the legacy of dependence on fossil fuels and escalating climate pollution and harms to the youth Plaintiffs. It is my professional opinion that HDOT remains fundamentally misaligned as an institution with fulfilling the State's comprehensive decarbonization vision and mandates; moreover, this condition shows no foreseeable prospect of changing any time soon without some form of intervention.

As a final note, I offer some insights based on my own experience as a former administrator of a DOT responding to a court action challenging systemic legal violations. When I was Deputy Commissioner for Policy at NYC DOT, the agency was sued for its slow progress in bringing the city's sidewalks and curb ramps into compliance with the Americans with Disabilities Act of 1990 (ADA). The litigation resulted in a $7.5 billion, 30-year court-approved settlement agreement establishing a comprehensive remedial plan and a fundamental shift in agency policy and funding priorities.

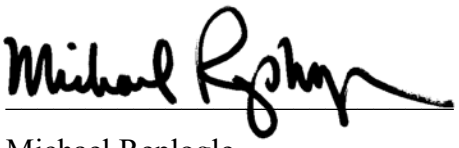
Among other commitments, NYC DOT agreed to conduct city-wide Light Detection and Ranging (LiDAR) surveys of every corner to inventory ADA-deficient locations, prioritize its workplan for installations and upgrades, and support ongoing performance monitoring. The DOT also provided public web access to the survey data and reported on its work progress. It agreed to address deficiencies as part of repaving and maintenance activities, while accelerating investment in curb remediation to meet ADA standards. It also agreed to be transparent about the specific reasoning and documentation for any project-level exceptions to meeting full ADA standards. The agency committed a total of $1.5 billion in its 10-year capital program and created a special 500-staff departmental unit dedicated to implementing the settlement. The court also appointed a monitor to review compliance.

I mention this experience as a concrete and practical example of how court action can be part of the process to achieve overdue reforms and protection of rights. The NYC DOT embraced the settlement as a way to institutionalize its governmental commitment to disability and access rights. The court's involvement was particularly instrumental in facilitating the support of the NYC Office of Management and Budget to approve the DOT funding commitments. Overall, the case helped to focus attention, marshal support and resources, and build public awareness to spur progress in an area in which the agency had previously struggled. Everyone involved appreciated the settlement as a positive step forward, and this appreciation will only grow as the necessary changes occur

such that, in the judge's words: "Years in the future, people will be used to nothing else but accessible curbs in New York City."

The State and HDOT have a similar opportunity in this case to embrace this legal process and their underlying governmental responsibilities so that, years from now, these youth Plaintiffs, all the parties involved, and future generations of the public can look back and see this as a historic moment that made a positive difference.

Signed this 23rd day of April, 2024 in Arnold, Maryland.



Michael Replogle

ATTACHMENT 1: CURRICULUM VITAE

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EXPERIENCE

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Principal | January 2022-present
Globally recognized catalytic leader and advisor on sustainable and equitable transportation policy and practices offering advisory services, expert testimony, and training to public, private, and non-profit organizations.

- Expert witness for plaintiffs in *Navahine F., et. al. v. Department of Transportation, State of Hawai'i, et. al.*, challenging the prolonged failure of state DOT to take steps to protect the environment for future generations by reducing traffic growth and greenhouse gas emissions. Prepared expert disclosure report in preparation for June 2024 trial in Hawaii State Court.

- Member, U.S. Environmental Protection Agency (EPA) Mobile Source Technical Review Subcommittee (MSTRS) of the Federal Clean Air Act Advisory Committee. 2019-present.

- As senior advisor to Institute for Transportation and Development Policy (ITDP), organized and coordinated TEAM for Climate Working Group uniting environmental, local government, and advocacy groups to promote more effective and equitable federal and state efforts for transportation decarbonization and environmental justice. Engaged National Association of City Transportation Officials (NACTO), Transportation for America, Georgetown Climate Center, Natural Resources Defense Council, Sierra Club, RMI, Southern Environmental Law Center, Equiticity, International Council for Clean Transportation, Smart State Transportation Initiative, Air Alliance of Houston, Equiticity, Coalition for Smarter Growth, and others. Submitted comments to and organized meetings with senior officials of US Department of Transportation (USDOT), Environmental Protection Agency (EPA), and White House advisors. 2022-2023.

- Strategic Advisor to *It's electric* as it develops on-street level-2 electric vehicle charging for dense urban and suburban neighborhoods, especially in under-resourced communities, with an innovative model for rapid scaling, active in New York City, Washington DC, Detroit, and elsewhere. 2022-present.

- Consultant to World Bank Asia Transport Division. Organized meetings for Dhaka, Bangladesh, Mayor and senior officials and with New York and Washington, DC officials. 2022.

New York City Department of Transportation
Deputy Commissioner for Policy | June 2015-June 2021
Managed Policy Unit, with a staff of 40 and 6 direct reports, including Safety Education. Guide agency's long-term strategy; advise DOT Commissioner and Mayor's Office on diverse issues. Initiate, coordinate, and evaluate new initiatives, including safety, bike and car sharing, electric vehicle

charging, freight, parking, mass transit, regional planning, economic appraisal, asset management, universal access, autonomous vehicles, and federal policy. Achievements include:

- Developed conceptual framework for NYC's "Open Restaurants" as a rights-based bottoms-up rapidly scalable program that within 3 weeks enabled 6,000 restaurants to make use of adjacent street parking for dining. Program grew to over 10,000 restaurants in 2 months, saving 100,000 jobs.
- Helped NYC win and accepted International Transport Forum 2018 Global Award for Vision Zero, recognizing City's success in cutting road deaths 28% in 4 years, while these rose 15% across the U.S.
- Guided policy to install 2,000+ speed enforcement cameras in school zones, yielding 73% drop in speeding and one-third reduction in pedestrian injuries at camera locations from 2019 to 2021.
- Worked with the New York State Department of Transportation to transform the I-895/Sheridan Expressway to a boulevard; supported Mayoral-appointed Blue Ribbon Panel on the Brooklyn Queens Expressway; helped manage NYC's Great Streets Program that transformed Queens Boulevard (which had been known as "The Boulevard of Death") and other high volume arterial roads into safe complete streets accommodating efficient motor vehicle traffic as well as pedestrians, cyclists, and public transportation.
- Managed transportation element of NYC's *Roadmap to 80x50* Climate Action Plan and development of *NYCDOT's Strategic Plan 2016: Safe, Green, Smart, Equitable*, and ongoing progress reporting.
- Managed development of *Electrifying New York: An Electric Vehicle Vision Plan for New York City*, and team that delivered NYC DOT pilot projects for 120 new On-Street level 2 Electric Vehicle Chargers and multiple DC Fast-Charging hubs, supported by ConEd and consultants.
- Advanced framework to modernize curb administration and enforcement in NYC, converting to digital "Pay-by-Plate" license-plate-based system to cut placard abuse and boost efficiency. Guided DOT Smart Truck Management Plan, Parking Blueprint, expansion of DOT's freight unit, and congestion pricing strategy. Led interagency working group with Department of Finance and NY Police Department to change commercial parking and double-parking rules to reduce congestion.
- Worked with Taxi and Limousine Commission (TLC) on studies and rulemakings to manage the impacts of for-hire vehicles on congestion, to raise driver income, and to use image analytics and connected vehicle technology to promote traffic safety.
- Helped negotiate $100 m agreement with Lyft to expand NYC's docked bikeshare system to 40,000 bikes and add pedal-assist e-bikes. Created vision for city-wide dockless bike share.
- Managed initial stages of NYC Congestion Pricing design, operational planning, and traffic impact analysis in collaboration with MTA.
- Worked with NACTO and city transportation officials across U.S. to develop data standards for taxis, for-hire vehicles, and new mobility and expand access to data needed for sound governance and planning.
- As member of NYC Automated Decision Systems Task Force, developed recommendations to City Council and Mayor for safeguards regarding use of artificial intelligence (AI) in governance.
- Represented NYC DOT in planning for Port Authority Bus Terminal replacement, Penn Station renewal, and Gateway corridor rail.

- Testified at March 2019 Senate Environment and Public Works Committee hearing on transportation and the economy; testified at October 2016 NYC Council hearing on autonomous vehicles; represented NYC at global climate summit in Paris in 2016 and in other key meetings.
- Deeply engaged as a founding member of the Open Mobility Foundation, supporting the development of open-source standards and tools that provide scalable mobility solutions for cities, enabling transfer of data between private and public stakeholders in the urban traffic environment.

New York University, Wagner Graduate School of Public Service

Adjunct Professor | January-April 2021

- Organized and taught class on topics in sustainable urban transportation policy and practice, with focus on innovations and challenges in New York City.

Institute for Transportation and Development Policy

Managing Director for Policy and Founder | 2009-2015

- Organized campaigns and developed strategic relationships with national governments, multilateral banks and institutions, and corporate leaders to scale-up sustainable transport financing, program appraisal, and project implementation initiatives to boost bus rapid transit, rail investment, traffic safety, bikesharing, and transit-oriented development. Strategic advisor to China, Brazil, Mexico, and U.S. national governments on transport policy.
- Cited in 2011 by *Bloomberg Business Week* as one of the world's leading global experts on transportation.
- As part of Senior Management Team for ITDP, co-managed 70+ staff, $7 million a year non-profit organization, with focus on organizational development, strategy, and policy, with direct responsibility for four direct reports, a roster of consultants, and budget of $2-3 million a year.
- Managed best practice guides, training, and capacity-building initiatives on bus rapid transit, travel demand management, parking, transport and carbon finance, and tear-down of urban motorways.
- Advised Jakarta and Yogyakarta governments on strategies to manage traffic on several major traffic corridors with street space reallocation, streetscape redesign, and road user and parking pricing.
- Consultant to Asian Development Bank, InterAmerican Development Bank, and Global Environmental Facility on methods to evaluate greenhouse gas impacts of transportation. Advisor to Climate Bonds Initiative on certification standards for transport sector.
- Advised Beijing Mayor on parking and road charging, with many parking recommendations implemented in 2013. Co-author of China Council for International Cooperation in Environment and Development report which was presented to the China State Council, *Promoting Urban Green Travel* (2013), shaping China Ministry of Transport's work. Visiting Professor at the China Academy of Transportation Sciences in Beijing (2013-15).
- Testified before U.S. Senate Banking Committee, Housing Transportation and Community Development Subcommittee, July 7, 2009, regarding the impact of transportation on climate change and the potential role of transit and livable communities in mitigating greenhouse gas emissions.

Partnership on Sustainable Low Carbon Transport

Chairman and Co-Founder | 2009-2016

- Developed and guided global partnership of 90 organizations -- Multilateral Development Banks (MDBs), UN agencies, NGOs, research institutes -- to mainstream sustainable transport in climate change policy and sustainable development goals and finance, and chaired SLoCaT Foundation.
- Mobilized successful $175 billion 10-year voluntary commitment for more sustainable transport from 8 MDBs at 2012 Rio+20 conference, with annual reporting. Worked with Asian Development Bank and MDBs to develop widely used Sustainable Transport Appraisal Rating (STAR) tool which is used to evaluate contributions to sustainability of thousands of transportation projects annually.

Environmental Defense Fund (EDF)

Transportation Director | 1992-2009

- Shaped development and implementation of U.S. transportation laws and advised governments on urban planning, transport management and finance, public-private partnerships, and environmental analysis for EDF, a million member, $100 million, non-profit advocacy group. Managed initiatives to curb growth in car use and sprawl by promoting best practices in US metropolitan areas and implementation of federal policies guiding transportation planning and project development. Deep engagements in Washington-Baltimore, New York, New Jersey, Portland, Atlanta, Denver, Austin, and San Joaquin Valley. Advisor and participant in technical missions related to bus rapid transit, air quality, and transportation planning in Jakarta, Bogota, Havana, Mexico City, many other cities. Managed 3-5 direct reports, extensive roster of consultants, and budget of $1-3 million a year.
- Leading environmental advocate for increased use of public-private partnerships to manage transport systems, supported by performance-contracting. Frequently invited to testify at US Congressional committees, White House meetings, state legislative bodies, and conferences about how transportation strategies and PPPs can achieve key public policy goals.
- Helped guide development of 5 successive U.S. federal transportation bills through Congress and related regulatory development, beginning with ISTEA in 1991 through SAFETEA-LU in 2006-09, focusing on clean air analysis, environmental review process, funding for clean air, transit, and enhancement programs, and federal transport planning requirements.
- Lead lobbyist for U.S. environmental movement on U.S. transportation law and policy in Congress and key federal agencies. Managed complex lobbying, litigation, and strategic communications efforts to bring about more effective regional transportation planning and use of market incentives to improve transport system performance. Advisor to federal and local officials regarding US DOT Urban Partnerships and Congestion Reduction Pilot Programs.
- Strategic advisor to New York City congestion pricing campaign (2006-08), supporting New York City Traffic Congestion Mitigation Commission, analysis of traffic, air quality, and equity impacts conducted by PB Consult and NY City Partnership, and technical studies and lobbying of state legislators about design and impacts of automated tolling of East River and Harlem River bridges.

- Member of NY Metropolitan Transportation Council (NYMTC) Travel Model Advisory Committee (2000-2005), advising on surveys, adoption of activity-based travel model, evaluation of Transportation Control Measures for air quality conformity, and conformity waiver following 9/11. Co-Chaired Mid-Hudson South Mobility Advisory Committee I-287 Task Force. Considered widening of I-287 in Westchester County (1995-2000) and secured time-of-day tolling on NY Throughway facilities. Strategic advisor to Tri-State Transportation Campaign board and staff on NY metropolitan region transportation issues (1992-2006). Expert witness in litigation Clean Air Act and NEPA litigation in New Jersey (1994). Advisor to New York City bike plan proposed by Transportation Alternatives (1993-95).
- Managed study for Mexico City government of plan for Mexico City Bus Rapid Transit network, including BRT line from airport to historic city center, to spur mobility and economic and social revitalization of decaying neighborhoods.
- Organized a coalition with environmental justice groups in Atlanta that shifted $300 million from sprawl inducing roads into public transport, walking, cycling, road safety, and maintenance, linking clean air, transport, and civil rights concerns in an effective legal-political strategy.
- Organized and guided pathbreaking *Moving Cooler* study that modeled alternative policy scenarios for U.S. transport sector VMT and CO2 emissions. Study was presented to US Congress and showed how sustainable transport strategies could not just cut CO2, but save consumers and taxpayers billions on transport costs while boosting public transport mobility for lower income people.
- Managed EDF initiative, *Reinventing Transit*, documenting how public transportation innovations serve mobility needs in diverse American communities, from rural and exurban areas to suburban and urban centers. Managed $2 million Commuter Choice media campaign for Maryland DOT as Treasurer and co-founder of Clean Air and Transportation, Inc. in partnership with US EPA.
- Managed Alternatives Analysis study of proposed outer beltway and BRT and light rail alternatives in Montgomery-northern Prince George's Counties, MD, considering air and water quality, traffic, CO_2, energy use, for coalition of civic groups. Managed study of express bus options on HOT lanes in northern Virginia. Founding member DOT/EPA Travel Model Improvement Program Advisory Panel (1993-1997).
- Guided regional Vision Plan initiatives that reshaped several major U.S. metro areas. As advisor to 1000 Friends of Oregon, 1989-94, designed and guided the study, *Making the Land Use-Transportation-Air Quality Connection (LUTRAQ),* which created template for the *Portland 2040 Plan* and numerous other U.S. vision planning initiatives. Designed and co-managed the Baltimore Regional Partnership visioning initiative with the Baltimore Metropolitan Council 1999-2003, linking the Baltimore Urban League, 1000 Friends of Maryland, Chesapeake Bay Foundation, and Environmental Defense Fund. Strategic advisor to long-range plan development in Denver, Atlanta, and New York.
- Worked in 1990s and early 2000s with industry and stakeholder groups as a member of the Intelligent Transportation Systems for America (ITSA) Environment and Energy Committee to consider how to strengthen integration of ITS with environmental and energy strategies and other modes, writing several papers on this subject.
- Member EPA Freight, Economy and Environment Working Group (1995-97). Member of U.S. EPA MOVES Emission Model Advisory Committee overseeing preparation of new federal emission factor

model (2007-2009). Wrote paper and conducted briefings on how an indirect source rule (ISR) could help cut pollution from new development, contributing to adoption of San Joaquin Valley Air Pollution Control District ISR (2005).

- Directed efforts to enforce and defend the Clean Air Act transportation conformity provision, winning 1999 US Court of Appeals ruling to close EPA regulatory loophole that exempted road projects from accountability for air quality. Directed litigation that diverted $300 million in funds from sprawl-inducing highway expansions around Atlanta into transit, safety, and pedestrian/bicycle improvements.
- Directed successful lawsuit resulting in EPA settlement agreement to enforce missed deadlines for issuance of federal or state implementation plans for attainment of ozone standards in the 10 largest U.S. metropolitan regions outside Los Angeles, including regional pollution caps that helped cut transportation plans motor vehicle emissions (1998-2001). Directed successful lawsuit settled in 2000 with EPA agreement to reinstate existing ozone non-attainment designations for over 1500 counties that had been exempted from transportation conformity accountability standards.
- Testified in legal cases on effects of added transportation capacity on traffic and pollution in Florida, Oregon, New Jersey, Connecticut, and District of Columbia. (1994-99).

Institute for Transportation and Development Policy

Founder and President | 1985-1992, 1998-2009

- Led organizational start-up and development as volunteer President of the Board. Responsible for conceiving and incorporating organization, forming board of directors, managing fundraising, strategic planning, organizational development, hiring of executive directors. Helped win $2 million US AID grant to promote livable cities transport initiatives in Africa, Asia, and Latin America (2002-04) and $6 million/year 5-year Climate Works grant in 2008, growing ITDP staff to 70+ in 8 offices worldwide.
- Organized and led 1984-88 Bikes Not Bombs campaign that recycled and sent 10,000 donated second-hand bicycles to Nicaragua to aid health and education programs. Project created and spun-off successful bicycle and wheelchair assembly and training workshops employing 40 local staff.

Opened new research areas with seminal research first defining sustainable transportation in 1987, published as "Sustainability: A Vital Concept for Transportation Planning and Development," *Journal of Advanced Transportation* (1990). Founded Transportation Research Board Committee on Transport Planning for Developing Countries (1985-92); elected *Emeritus* Member of Transportation Research Board Committee on Transportation in the Developing Countries in 2005.

Maryland-National Capital Parks and Planning Commission

Transportation Coordinator | 1983-1992

- Managed Transportation Modeling Group, M-NCPPC. Supervised work of 8 transportation engineers and planners who developed and used Montgomery County's computer transportation models and GIS for land use and transportation planning for jurisdiction of 800,000 people.

- Managed transport element on Montgomery County Vision Plan analysis. Lead transportation planner for long-range *Comprehensive Growth Policy Study* (1988-90), which evaluated transit/pedestrian-oriented development, demand management, and alternative infrastructure investments. This showed how county could double its population and employment over 30 years without excess congestion by focusing development around expanded transit, with improved walking and cycling, and traffic management.
- Managed *Montgomery County Annual Growth Policy*, which recommended development approval caps to County Council under the County's Adequate Public Facilities Ordinance, based on analysis of job and housing growth scenarios, policies, and investment options. Wrote *Alternative Transportation Scenarios and Staging Ceilings Staff Report,* and *Short-Term Traffic Alleviation Policy.*
- Managed development of innovative travel models, data collection, GIS, using EMME2 and TRANSCAD software. Initiated and managed household travel panel survey, and new approaches to measure pedestrian friendliness and its effects on travel behavior.
- Managed regional travel model and data systems development as founder and Chair of Travel Forecasting Committee of Washington Metropolitan Transportation Planning Board. Prepared workplans to support compliance by region to new federal requirements. Helped guide Long Range Plan and regional transportation improvement program, and air quality-transportation conformity analysis for Washington, DC region.
- Managed project planning studies, including *Corridor Cities Transit Easement Study* of potential light rail/busway from Shady Grove to Clarksburg and guided travel model analysis of master plans and Maryland State Highway Administration project planning studies.

Public Technology, Inc.

Research Associate | 1979-1983

- Documented and disseminated best practices in public transport and transport environmental mitigation, organizing conferences, training programs, and researching and writing articles and guidebooks.

SPEAKING

Speaker at hundreds of US and global transportation and environmental conferences. Lecturer at MIT, University of California/Davis, Cornell, George Mason, Catholic, George Washington, NYU, Harvard, University of Pennsylvania, American University, University of Vermont, Rutgers.

EDUCATION

- B.A. *cum laude* in Sociology, University of Pennsylvania, 1978.
- B.S.E. *cum laude* in Civil and Urban Engineering, University of Pennsylvania, 1978.
- M.S.E. in Civil and Urban Engineering, University of Pennsylvania, 1978.
- Week-long seminar in Negotiation, Harvard University, 1995.

CHRONOLOGICAL SAMPLE OF PUBLICATIONS

- M. Replogle, Comment on Docket No, DOT-OST-2023-0087: Regarding US DOT Equity Action Plan, on behalf of Institute for Transportation and Development Policy and 19 other organizations. June 2023.

- José Holguín-Veras, et.al. including M. Replogle, "The New York City Off-Hour Delivery Program: A Business and Community-Friendly Sustainability Program", *Interfaces,* Vol. 48 Issue 1, 2018 and NYUScholars.nyu.edu

- Michael Replogle, Carlos Felipe Pardo, Dario Hidalgo, Adriana Lobo, Salvador Herrera, David Uniman, Angelica Vesga, Stephanie Lotshaw, Dani Simons, Holly LaDue, Michael Kodransky, Aimee Gauthier, and Walter Hook (editors), *The Life and Death of Urban Highways*, Institute for Transportation and Development Policy, New York, 2012. https://www.itdp.org/2012/03/13/the-life-and-death-of-urban-highways/

- M. Replogle, "Congestion Charging Gains Ground in U.S.," *Sustainable Transport,* No. 19, Fall 2007.

- M. Replogle, "High Performance Corridors: Emerging Transportation Management Framework?," First International Conference on Funding Transportation Infrastructure, Baniff, Alberta, August 2006. University of Calgary.

- M. Replogle and Keri Funderburg, *No More Just Throwing Money Out the Window: Using Road Tolls to Cut Congestion, Protect the Environment, and Boost Access for All,* EDF, New York, NY, 2006.

- M. Replogle, Bob Yuhnke, and David Greenblatt, "Particulate Monitor Siting in Relation to Major Highways in Metro Washington, DC: Effects on Measured Pollution Concentrations and Implications for Policy," U.S. EPA 2006 National Air Monitoring Conference, Las Vegas, Nevada, November 2006.

- M. Replogle, "Putting a Price on Driving: Can Market Incentives Fix America's Transportation Woes?" *Next American City*, Issue 10, May 2006.

- M. Replogle, "New Law, New Questions, Missed Opportunities: What Does SAFETEA-LU Mean for Planning and the Environment," *Planning Magazine*, American Planning Association, May 2006.

- M. Replogle and John Balbus, M.D., M.P.H., "Considering Cancer Risk in Transportation Decision-Making," *Environmental Manager*, June 2005, page 14-17.

- M. Replogle, *New Toll Road vs. Toll Managed Lanes on Existing Motorways: Alternatives and Impacts In Metro Washington, DC*, PIARC/International Road Federation, *Proceedings of PIARC Seminar on Road Pricing with Emphasis on Financing, Regulation and Equity*, Cancun, Mexico, April 2005.

- Environmental Defense, Chesapeake Bay Foundation, Audubon Naturalist Society, Sierra Club, Coalition for Smarter Growth, *The Intercounty Connector: Impacts and Alternatives,* Washington, DC, January 2005.

- F. Kaid Benfield and M. Replogle, "The Roads More Traveled: Sustainable Transportation in America – Or Not", *Environmental Law Reporter*, Vol. 32, Number 6. 14 pages. June 2002 (also published in Dernbach, John C., *Stumbling Toward Sustainability,* Environmental Law Institute, Washington, DC, 2002, p. 647-665)

- Michael Oppenheimer and M. Replogle, *Sustainability and Renewal of Civil Infrastructure: An Environmental Perspective*, EDF, 1999. 20 pages.

- Replogle, Michael and David Reinke, “Estimating the Effects of Transportation Pricing Policies on Travel behavior: Current Techniques and Future Directions”, Presented to the Pricing Committee, Transportation Research Board 77th Annual Meeting, Washington D.C. 1998.

- M. Replogle, "Overcoming Barriers to Transportation Cost Internalization," *Social Costs and Sustainability: Valuation and Implementation in the Energy and Transport Sector,* (O.Hohmeyer, R.L.Ottinger, K.Rennings, eds.), Springer-Verag New York, 1997, 19 pg.

- Chesapeake Bay Foundation and Environmental Defense Fund, *A Network of Livable Communities: Evaluating Travel Behavior Effects of Alternative Transportation and Community Designs for the National Capital Region*, CBF, Annapolis, Md, May 1996.

- Edward Beimborn and Rob Kennedy, (M. Replogle, editor) *Inside the Black Box: Making Transportation Models a Tool for Livable Communities*, Citizens for a Better Environment/EDF, 1996, 52 pages.

- Walter Hook and M. Replogle, "Motorization and Non-Motorized Transport in Asia: Transport System Evolution in China, Japan, and Indonesia," *Land Use Journal*, Jan. 1996. 21 pages.

- M. Replogle, "Effects of Highway Capacity Changes on Energy Use and the Environment," a Minority Report to the Transportation Research Board study, *Expanding Metropolitan Highways: Implications for Air Quality and Energy Use*, July 1995. 15 pages.

- M. Replogle and Walter Hook, "Improving Access for the Poor in Urban Areas," *Appropriate Technology*, June 1995. 3 pages.

- M. Replogle, *Integrating Pedestrian and Bicycle Factors into Regional Transportation Planning Models: Summary of the State-of-the-Art and Suggested Steps Forward*, Urban Design, Telecommunication and Travel Forecasting Conference: Summary, Recommendations and Compendium of Papers, Travel Model Improvement Program, Arlington, TX, 1995. 21 pages.

- M. Replogle, "What's Sustainable," Suzan Zelinski and Gordon Laird (editors), *Beyond the Car: Essays on the Auto Culture*, Steel Rail Publishing, Toronto, 1995.

- M. Replogle and Hank Dittmar, *Integrating Transportation Management Strategies*, Presented at TRB conference on TDM, Arlington, VA, Nov. 1994. 24 pages.

- M. Replogle, *Intelligent Transportation Systems for Sustainable Communities*, EDF, June 1994. 22 pages.

- M. Replogle, *Transportation Conformity and Demand Management: Vital Strategies for Air Quality*, EDF, April 1993. 121 pages.

- M. Replogle, *IVHS at Risk: A Critique of the Draft National Program Plan for Intelligent Vehicle Highway Systems.* 1993. 20 pages.

- M. Replogle, *Bicycle and Pedestrian Programs in Asia, Australia, and New Zealand*, Federal Highway Administration, 1993. Free from National Bicycle & Pedestrian Clearinghouse: 800-760-6272. 84 pages.

- M. Replogle and H. Parcells, *Linking Bicycle/Pedestrian Facilities to Transit,* FHWA, 1993. National Bicycle & Pedestrian Clearinghouse.

- M. Replogle, *Non-Motorized Vehicles in Asian Cities,* World Bank Technical Paper No. 162, Asia Technical Department Series, 1992, 75 pp.

- M. Replogle, "Bicycle Access to Public Transportation: Learning from Abroad," *Institute of Transportation Engineers Journal,* Vol. 62, #12, Dec. 1992, 6 pages.

- M. Replogle, "Bicycle Access to Public Transportation: Learning from Abroad," *Transportation Research Record 1396*, 1991.

- M. Replogle, "Sustainability: A Vital Concept for Transportation Planning and Development," *Journal of Advanced Transportation*, Durham, NC, vol.25, no.1, Spring 1991, pp. 3-18 (Presented at Conference on Urban Transport in Developing Countries, Sao Paulo, Brazil, 1989). 8 pages.

- M. Replogle, "Sustainable Transportation Strategies for Third World Development," *Transportation Research Record No. 1294*, Transportation Research Board, Washington, DC, 1991, pp. 1-9 (paper presented at World Conference on Transport Research, Yokohama, Japan).

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- M. Replogle, "The Role of Bicycles in Public Transportation Access," *Transportation Research Record 959*, Transportation Research Board, 1989. Pg 55-62.

- M. Replogle, *Bicycles and Public Transportation: New Links to Suburban Transit Markets,* Bicycle Federation, 1983, Wash, DC. 180 pages.

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ATTACHMENT 3: BUDGET ANALYSIS METHODOLOGY

I am familiar with other research that has been conducted to analyze whether transportation budgeting decision aligns with climate change mitigation goals, which includes a recent report in California, as well as analysis produced in Hawai‘i by transportation experts at the Ulupono Initiative. (UCLA, 2021; Rubin et al., 2023; Rooney, 2021). I am also aware of others who are similarly doing these kinds of analyses, including Transportation for America. I used a similar approach to conduct such analysis in the Hawai‘i context, with adjustments based on the relevant and available documents in this state. Specifically, I reviewed the data from the State of Hawai‘i Fiscal Biennium Budgets ("Biennium Budgets") for the operations and capital improvements projects of executive branch agencies, which are publicly available on the capitol.hawaii.gov website.

I used data under the category "Transportation Facilities," under the specific subcategories for: TRN501 (Oahu Highways); TRN511 (Hawaii Highways); TRN531 (Maui Highways); TRN561 (Kauai Highways); and TRN595 (Highways Administration). As indicated in the Biennium Budgets, the projects listed under these five subcategories reflect the HDOT-Highways capital improvements projects that have been proposed and approved for funding. These transportation improvements budgets comprehensively include projects that receive federal funding, as well as projects that receive only state funding. Thus, they more broadly reflect HDOT's budgeting priorities, in comparison to other budget documents such as the STIP, which is a fiscally constrained document that focuses on the subset of projects that receive federal funding.

My review included the Biennium Budgets for the legislative years 2013 through 2023 to assess trends over the past eleven years.[29] This dataset totaled 1,872 projects totaling $8.61 billion in funding for the fiscal years 2013-14 to 2024-25.

Similar to an analysis that was conducted in California, I reviewed the data and organized the projects based on whether they would: (1) increase VMT, (2) decrease VMT, or (3) have no impact on VMT. The reason I looked at VMT is that it can serve as a proxy for transportation- related GHG emissions. (CARB, 2019). As a general proposition, projects that increase VMT increase GHG emissions and projects that decrease VMT decrease GHG emissions. In doing this work, I adapted the guidance issued by the State of California for assessing the VMT/GHG impact of projects (CA Office of Planning & Research, 2018;

[29] A list of source files for the Biennium Budgets from 2013-2023 is attached.

Rubin et al., 2023), which I generally agree with based on my own professional knowledge and experience. The projects are categorized as follows:

Projects that are likely to **increase VMT** include projects that add motor vehicle capacity, such as:

- The addition of through lanes on existing or new highways, including general-purpose lanes, high-occupancy vehicle (HOV) lanes, peak-period lanes, auxiliary lanes, or lanes through grade-separated interchanges.
- The installation or reconfiguration of traffic lanes and/or intersections designed to reduce the travel time for motor vehicles other than projects that are focused on giving priority to public transportation, walking, and cycling.

Projects that are likely to **decrease VMT** include projects that expand or enhance access for multimodal forms of transportation, such as:

- Improving or increasing access to transit;
- Orienting a project toward transit, bicycle, or pedestrian facilities;
- Improving pedestrian or bicycle networks, or transit service; and
- Implementing roadway pricing or substantive incentives for ridesharing.

Projects that are likely to have **no impact on VMT** include projects that neither add motor vehicle capacity or expand or enhance access to multimodal forms of transportation, such as:

- Rehabilitation, maintenance, replacement, safety, and repair projects that are designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity;
- Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase or reduce vehicle travel;

- Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles or to replace a lane in order to separate preferential vehicles (e.g., HOV, high-occupancy toll, or trucks lanes) from general vehicles; and
- Installation of roundabouts or traffic circles.

In several instances, the description of transportation projects in the Biennium Budgets include both the addition of new road capacity or reconstruction or replacement of existing bridges or highway segments, along with the addition of sidewalks or bicycle facilities. In the absence of a more detailed breakout of this information, I have generally assumed for this analysis that 80% of the cost of such projects are attributable to the added capacity (i.e., VMT increasing) or to the reconstruction or replacement (i.e., VMT neutral) and 20% of the cost of such projects are attributable to the pedestrian and/or bicycle improvement associated with the project (i.e., VMT decreasing). This is a conservative approach given the much higher costs of traditional roadway work, as well as the science that capacity expansions increase VMT and are not mitigated by concurrent multimodal accommodations. In other words, I took extra steps to give credit for multimodal investments, even when they were only add-ons to capacity expansion projects.

I also created a separate category for projects that have no impact on VMT but include GHG emission reductions, such as energy efficient highway lighting upgrades and electric vehicle charging stations. For highway lighting upgrade projects that did not specify whether the upgrades involved the conversion to more energy efficient lighting, I conservatively assumed these upgrades would reduce energy consumption and thus reduce GHG emissions.

I also categorized projects based on whether they involved expansions or enhancements for bicycles or pedestrians, or neither. This categorization allowed me to count the number of projects with and without these improvements, which sheds further light on the extent to which HDOT is investing in a fully connected multimodal network.

In instances where it was unclear from the available description of the project whether it would increase VMT or have no impact on VMT, I conducted further research on the nature and details of the project as could be gleaned from publicly available information. If I was ultimately unable to find supporting information, I conservatively assumed there was no VMT impact.

Some project descriptions were so generalized and vague that I was unable to discern the nature of the projects, including whether they involved bicycle or pedestrian improvements. These included broad categories such as "Construction for Highways Division Projects Receiving Federal Discretionary Grant Awards" or "Construction for Completion and Closeout of Outstanding Construction Projects," which would seem to encompass any number of discretionary projects of indeterminate nature and scope. In these instances, I categorized the items as "insufficient information provided."

I relied on the following list of Biennium Budgets to perform my analysis:

2013 Highways CIP projects appropriated under Act 134, 06/18/2013
(Gov. Msg. No. 1234)

Source 1:
https://www.capitol.hawaii.gov/sessions/session2013/bills/GM1234_.pdf
Source 1:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_Archives.aspx?billtype=HB&billnumber=200&year=2013

2014 Highways CIP projects appropriated under Act 122, 06/24/2014
(Gov. Ms. No. 1225)

Source 2:
https://www.capitol.hawaii.gov/sessions/session2014/bills/GM1225_.pdf
Source 2:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_Archives.aspx?billtype=HB&billnumber=1700&year=2014

2015 Highways CIP projects appropriated under Act 119, 06/12/2015
(Gov. Msg. No. 1219)

Source 3:
https://www.capitol.hawaii.gov/sessions/session2015/bills/GM1219_.pdf
Source 3:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_archives.aspx?billtype=hb&billnumber=500&year=2015

2016 Highways CIP projects appropriated under Act 124, 06/23/2016
(Gov. Msg. No. 1225)

Source 4:

https://www.capitol.hawaii.gov/sessions/session2016/bills/GM1225_.PDF
Source 4:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_archives.aspx?billtype=hb&billnumber=1700&year=2016

2017 Highways CIP projects appropriated under Act 49, 06/21/2017
(Gov. Msg. No. 1149)

Source 5:
https://www.capitol.hawaii.gov/sessions/session2017/bills/GM1149_.PDF
Source 5:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_archives.aspx?billtype=hb&billnumber=100&year=2017

2018 Highways CIP projects appropriated under Act 053, 06/22/2018
(Gov. Msg. No. 1153).

Source 6:
https://www.capitol.hawaii.gov/session2018/bills/GM1153_.PDF
Source 6:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_archives.aspx?billtype=hb&billnumber=1900&year=2018

2019 Highways CIP projects appropriated under Act 040, 06/07/2019
(Gov. Msg. No. 1141).

Source 7:
https://www.capitol.hawaii.gov/session2019/bills/GM1141_.PDF
Source 7:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_archives.aspx?billtype=hb&billnumber=1259&year=2019

2020 Highways CIP projects appropriated under Act 006, 07/07/2020,
(Gov. Msg. No. 1107).

Source 8:
https://www.capitol.hawaii.gov/session2020/bills/GM1107_.PDF
Source 8:
https://www.capitol.hawaii.gov/session/archives/measure_indiv_archives.aspx?billtype=hb&billnumber=2725&year=2020

2021 Highways CIP projects appropriated under Act 088, on 06/24/2021 (Gov. Msg. No. 1190).

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Report to the Thirty-Second Legislature

2023 Regular Session

SEA LEVEL RISE VULNERABILITY AND ADAPTATION REPORT

Prepared by the

State of Hawaii Department of Land and Natural Resources,

Office of Conservation and Coastal Lands

In response to Act 32,

of the Regular Session of 2017;

December 2022

ATTACHMENT C

Hawai`i Sea Level Rise Vulnerability and Adaptation Report

2022 Update

Hawai`i State Climate Commission

Acknowledgements

The Hawai'i State Climate Commission gratefully acknowledges the hard work of the project team for compiling this report. The project team consists of Leah Laramee, Hawai'i Climate Change Mitigation & Adaptation Coordinator, Dr. Bradley Romine and Amy Wirts of the University of Hawai`i Sea Grant College Program, Dr. Charles Fletcher, Dr. Shellie Habel, Dr. Juliette Budge and Colin Lee, Esq of the University of Hawai'i School of Ocean and Earth Sciences Climate Resilience Collaborative, and Amanda Ho, Community Engagement and Climate VISTA.

Mahalo to the many representatives of state and county agencies who provided editing and information regarding agency actions.

Table of Contents

Executive Summary

Hawai`i Sea Level Rise Vulnerability and Adaptation Report 2022 Update

Appendix A - Responses to Learning Questions from 2017 Report

Hawai`i Sea Level Rise Vulnerability and Adaptation Report 2022 Update Executive Summary

Introduction

The 2017 Hawai`i Sea Level Rise Vulnerability and Adaptation Report (2017 Report) was mandated by the Hawai`i Climate Change Adaptation Initiative (Act 83 (Session Laws of Hawaii (SLH) 2014)), and expanded by the Hawai`i Climate Change Mitigation and Adaptation Initiative (Act 32, SLH2017). Through this report the Legislature aimed to address the threat posed by climate change to the economic well-being, public health, natural resources, and environment of Hawai`i. The 2017 Report was prepared in recognition that sea level rise (SLR) is an inevitable outcome of global warming that will continue far into the future, even with an immediate and drastic reduction of greenhouse gas emissions.

In addition to the preparation of the 2017 Report, Act 32 charged the Hawai`i Climate Change Mitigation and Adaptation Commission to conduct a comprehensive review of implementation and submit a report to the governor, legislature, and the counties no later than twenty days prior to the convening of the regular session of the 2023 Legislature and every five years thereafter. This document serves as the five-year update to the 2017 Report and the Commission's report on recent sea level rise adaptation initiatives across State and County government, many of which are a direct result of the information and map data provided by the 2017 Report and companion State of Hawai`i Sea Level Rise Viewer (Viewer).

Scientific Observations and Predictions

In 2017, and again in 2020, the Honolulu Harbor Tide gauge recorded its highest daily mean water levels observed over its 112-year history. These record high water levels were produced by a combination of phenomena that included long-term global sea level rise, peak annual astronomical tides ("king tides"), wave setup, and migration of warm buoyant waters brought in by winds and currents. These events provide a glimpse of what will become a more regular occurrence as sea level continues to rise. Local impacts were observed throughout the State in the form of increased coastal erosion, minor wave over-wash flooding, backshore flooding from groundwater rise and storm drain backflow, and impeded and potentially hazardous beach access.

The United Nations Environment Program Emissions Gap Report, 2022 indicates that globally, nations have missed the emissions goals that may have constrained overall global warming to 1.5° C, and that given our current path and past actions, the world is likely to warm by 2.8°C by the end of the century. Sea level responds to greenhouse gas emissions more slowly than global surface temperature. This slow response leads to long-term committed SLR, associated with ongoing ocean heat uptake and the slow adjustment of the ice sheets. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report states with high confidence that "*Global mean sea level will continue to rise for thousands of years, even if future CO_2 emissions are reduced to net zero and global warming halted, as excess energy due to past emissions continues to propagate into the deep ocean and as glaciers and ice sheets continue to melt*." (Arias, et al. (2021)).

Sea level rise exposure mapping in the 2017 Hawai'i Sea Level Rise Report and Hawaii Sea Level Rise Viewer is based on an upper-end projection in the 2013 IPCC 5th Assessment Report of 3.2 feet of global mean sea level rise by 2100. Since completion of the 2017 Report, peer-reviewed scientific literature as

well as government and multinational reports increasingly point to 3 to 4 feet of sea level rise by 2100 as a mid-range, rather than high-end, scenario for Hawai'i. Long-term observational data from local tide gauge stations show that sea level is rising around Hawai'i. Models indicate that Hawai'i and other tropical Pacific sites will experience sea level rise that is 16% to 20% higher than the global average (Sweet. et al. 2022). As the science progresses towards increasingly concerning rates of sea level rise for Hawai`i, it remains imperative that the legislature and state and county agencies maintain a long-term focus on building resiliency to rising seas by reducing overall vulnerability of infrastructure and implementing adaptation measures to allow our state to continue to thrive with higher seas.

Accomplishments and Progress

The 2017 Report included nine recommendations with 49 recommended actions aimed at improving the state's capacity to address the social, economic, and environmental impacts of sea level rise.

Key Statewide Accomplishments:

Use of the Sea Level Rise Exposure Area Data and Sea Level Rise Viewer: Although the Sea Level Rise Exposure Area (SLR-XA) was not officially recognized as a state-wide vulnerability zone, the Viewer and SLR-XA are in widespread use by state and county agencies for adaptation planning purposes.

**Hawai`i Coastal Zone Management Act Updates**: Act 16, SLH2020 updated the Hawai`i Coastal Zone Management Act (HRS Chapter 205A) including strengthening protections for beach and other coastal environments by specifically prohibiting private shoreline hardening structures and minimizing public shoreline hardening structures, including seawalls and revetments, at sandy beaches where they would interfere with existing recreational and waterline activities.

Sea Level Rise Report Addendum: The *Guidance for Using the Sea Level Rise Exposure Area in Local Planning and Permitting Decisions* was published by the State as a supplement to the 2017 Report. The Addendum was prepared by the University of Hawai`i Sea Grant College Program (Hawai`i Sea Grant) with the Hawai`i Department of Land and Natural Resources - Office of Conservation and Coastal Lands (OCCL) for the Hawai`i Climate Change Mitigation and Adaptation Commission - Climate Ready Hawai`i Initiative. The Hawai`i Climate Change Mitigation and Adaptation Commission issued a statement of approval for the Addendum at its October 28, 2020 meeting.

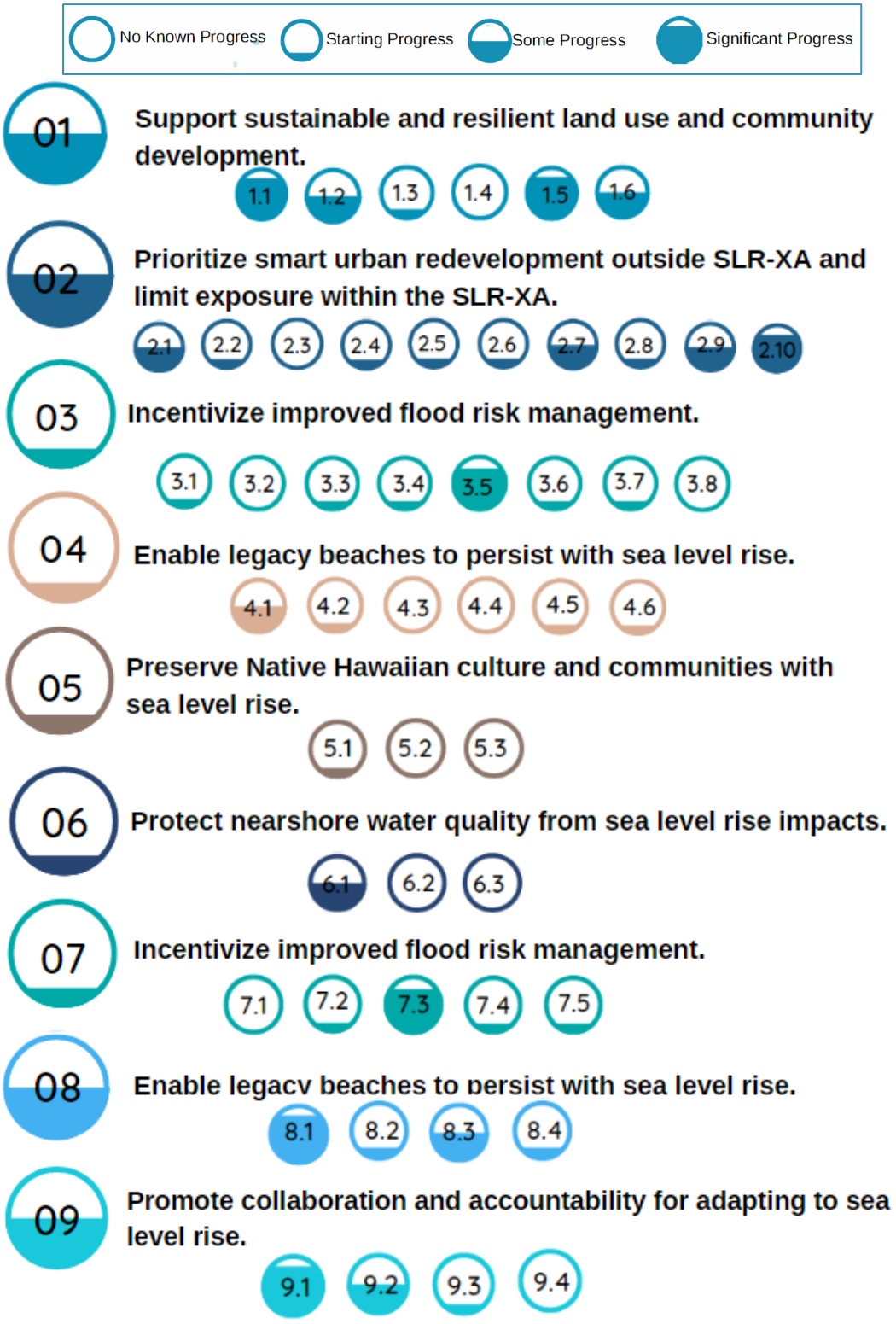
Hawai`i 2018 Hazard Mitigation Plan: The 2018 update of the State's Hazard Mitigation Plan includes expanded consideration of climate change and sea level rise hazards, including hazard assessment using the SLR-XA and a 1% Annual-Chance Coastal Flood Zone with 3.2 feet of sea level rise (1%CFZ-3.2) modeled for the Plan: https://dod.hawaii.gov/hiema/sert-resources/hazard-mitigation/

Planning for Managed Retreat: The Office of Planning and Sustainable Development Coastal Zone Management Program (OPSD-CZM) published a report titled *Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i* in 2019 and is embarking on a next-step study that will assess the options for and implications of implementing managed retreat from the perspectives of (1) policy and regulation, and (2) funding and financing mechanisms in 2023.

Statewide Inventory of Vulnerable Infrastructure: Act 178 Relating to Sea Level Rise Adaptation was passed to begin the long-term planning needed to effectively address climate impacts. OPSD-CZM submitted a report to the legislature in 2021 reporting on progress towards the phased approach required by Act 178.

Summary of Accomplishments

Progress towards meeting the nine recommendations (represented by large circles) and 49 associated recommended actions (represented by small circles underneath) is presented here as measured on a qualitative scale of "no known progress" to "significant progress" as depicted by the following key:



Next Steps

New and updated recommendations provide a roadmap for bridging from this interim report to a full, comprehensive Sea Level Rise Vulnerability and Adaptation Report in 2027. This Report Update recommends continuing work on the nine 2017 Recommendations and associated recommended actions, and adds two new 2022 Recommendations with supporting recommended actions.

2022 Recommendation 1 is to fund and conduct a comprehensive update of the Sea Level Rise Vulnerability and Adaptation Report in 2027, and **2022 Recommendation 2** is to continue to implement the 2017 Recommendations with minor edits as outlined in this 2022 Report Update. The recommended actions within these two new recommendations provide a framework for further identifying gaps in progress since 2017 and meeting the overall goals of this initiative. A key updated recommended action is for the state to set a revised planning and policy benchmark of 4 ft (up from the 2017 guidance of 3.2ft) as the minimum scenario for all planning and design based on the report's Intermediate (mid-range) scenario for Hawai`i of 3.9 feet of sea level rise by 2100, and apply a 6 ft benchmark for planning and design of public infrastructure projects and other projects with low tolerance for risk based on the report's Intermediate High scenario for Hawai`i of 5.9 feet of sea level rise by 2100.

In addition to the recommendations, this report has identified the following unmet needs and areas in need of focus in the next five years which should be set as priority action areas from 2023-2027.

- **Facilitate interagency coordination for holistic adaptation planning** (e.g., comprehensive consideration and planning for natural resources, roads, communities; and improved communications between government agencies) (2017 Recommendation 9, 2022 Recommendation 1)
- **Conserve and adapt Native Hawaiian cultural resources and sites** (2017 Recommendation 5)
- **Integrate equity and justice considerations to vulnerability assessments and adaptation planning and actions** (2017 Recommendation 2)
- **Address and stop the loss of shoreline access** (2017 Recommendation 4)
- **Integrate economic valuation and ecosystem co benefits of natural coastal resources into planning and actions** (2017 Recommendations 4, 5 and 8)
- **Make managed retreat a viable option and identify funding mechanisms for adaptation** (2017 Recommendations 2 and 7)
- **Implement phased adaptation to sea level rise** (2017 Recommendation 1, 2, 7)

Our understanding of the sea level rise outlook has improved since the 2017 Report and we now have a better understanding of the most probable impacts of sea level rise in Hawai`i. This Updated Report and the recommendations within should be used as a tool by the decision makers of the State, the Counties, and community leaders. Recommendations to increase our capacity to adapt to sea level rise should be implemented across the levels of government now to address the inevitable near and medium-term rise of sea level rise.

Hawai`i Sea Level Rise Vulnerability and Adaptation Report 2022 Update

Introduction

The 2017 Report provided the first detailed statewide assessment of Hawaii's exposure to sea level rise related hazards and proposed recommendations to reduce the state's vulnerability to sea level rise and increase our capacity to adapt. This report is intended as a five-year update to the 2017 Report and is not a full review or stand-alone document. Instead, it refers to the 2017 Report and provides an overview of updates to climate and sea level rise science, the accomplishments achieved relative to the 2017 Report recommendations, and provides updated recommendations for the next five years and beyond. "Learning Questions" posed by the 2017 Report are directly addressed in Appendix (A) of this Report.

Sea Level Rise Outlook: Updated Global and Local Projections

The 2017 Hawai`i Sea Level Rise Vulnerability and Adaptation Report provided a detailed overview of climate science and sea level rise observations and predictions based on the latest and best-available science at that time including the Intergovernmental Panel on Climate Change Fifth Assessment Report (IPCC AR5) and the U.S. Global Change Research Program (USGCRP) 4th National Climate Assessment. As expected, climate and sea level rise science has continued to advance since the 2017 Report, with landmark intergovernmental reports including the IPCC AR6 in August 2020 and NOAA-led Sea Level Rise Technical Reports in 2017 and 2022. An update on Sea Level Rise Science was provided as an appendix in an October 2020 Hawai`i Climate Change Commission document, Guidance for Using the Sea Level Rise Exposure Area in Local Planning and Permitting Decisions - A Supplement to the Hawai`i Sea Level Rise Vulnerability and Adaptation Report. In July 2022, the City and County of Honolulu Climate Change Commission provided an updated guidance document on the latest sea level rise science and projections with recommendations for adaptation planning. This section provides an overview of the latest climate science and sea level rise projections published in those documents with specific regional and local projections and likely impacts.

Global and Local Sea Level Rise Trends

Sea level rise exposure mapping in the 2017 Hawai`i Sea Level Rise Report and Hawai`i Sea Level Rise Viewer (Viewer) is based on an upper-end projection in the 2013 IPCC 5th Assessment Report of 3.2 feet of global mean sea level rise by 2100. As expected, the science on sea level rise observations and forecasts has continued to advance. Since completion of the 2017 Report, peer-reviewed scientific literature as well as government and multinational reports increasingly point to 3 to 4 feet of sea level rise by 2100 as a mid-range, rather than high-end, scenario for Hawai`i. These increasing projections of sea level rise are based on greenhouse gas emissions, which continue to increase, and observations of accelerating ice mass loss to the oceans, particularly from Greenland and West Antarctica. The projections are often provided to 2100, though sea level rise will likely continue for centuries.

Since 1993, 27 years of continuous satellite altimeter measurements tied to tide gauges and averaged across the planet (Figure 1) show that global mean sea level is not only rising at a rate of 3.4 mm/yr (1.3 inches per decade, sealevel.nasa.gov), it is accelerating at a rate that will lead to 23 cm (9 inches) of global mean sea level rise by 2050 (relative to the year 2000; Nerem et al., 2022). Continued global warming is expected to increase this rate of acceleration, and therefore 9 inches of sea level rise by 2050 is likely a conservative (low-end) sea level rise scenario for that timeframe.

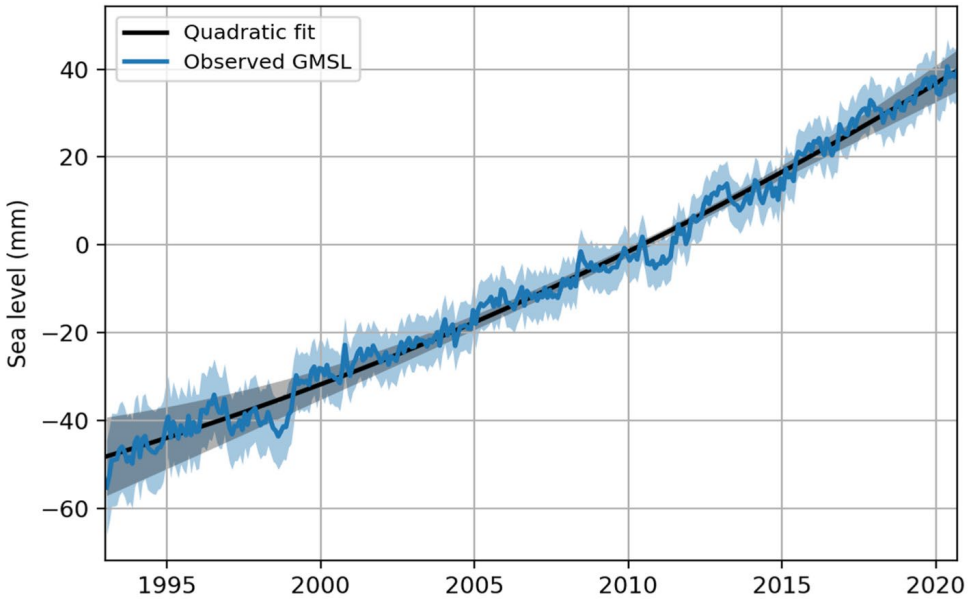


Figure 1. Global mean sea level is rising at a rate of 3.4 mm/yr (1.3 inches per decade, sealevel.nasa.gov) and this rate is accelerating (Figure: Nerem et al., 2022).

The most recent projections of global and regional sea level rise are published in a 2022 intergovernmental report led by NOAA (Sweet et al. 2022). The 2022 report builds on a 2017 NOAA report (Sweet et al., 2017) and global mean sea level rise scenarios from the United Nations Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6; IPCC 2021). Key findings of the NOAA 2022 report include:

- Increased confidence, regardless of Greenhouse Gas (GHG) emissions scenario, in sea level rise projections at 2050 with sea level expected to rise as much over the next 30 years as it has over the last 100 years.
- An increase in magnitude and frequency of coastal flooding by 2050 from high tide and storm surge flood events with significant consequences to coastal infrastructure, communities, and ecosystems.
- A 50% probability of exceeding 0.5 m (1.6 ft) of sea level rise globally by 2100 with an increase in average global temperature of 2°C above preindustrial levels (global temperature has already risen 1.01°C since 1880). The probability of exceeding 0.5 m (1.6 ft) of global sea level rise increases to 80% to 99% under higher GHG emissions scenarios with 3°-5°C of warming, respectively. These probabilities do not consider the potential for faster-than-projected ice

sheet losses in Antarctica and Greenland within this century, which is a focus of ongoing research.

- There is a 50% probability of exceeding 1.0 m (3.3 ft) and 10% probability of exceeding 2.0 m (6.6 ft) of global sea level rise by 2100 when considering a high GHG emissions scenario that leads to an average global temperature increase of 5°C plus the impact of earlier and faster ice sheet losses from Antarctica and Greenland. While physically plausible, the likelihood of widespread ice sheet collapse to that extent within this century is currently unknown and is an active area of ongoing observation and research.

Long-term observational data from local tide gauge stations show that sea level is rising around Hawai`i. Models indicate that Hawai`i and other tropical Pacific sites will experience sea level rise that is 16% to 20% higher than the global average (Sweet. et al. 2022). The NOAA 2022 report provides a range of regionalized sea level rise scenarios based on differing GHG emissions pathways and associated global warming and ice sheet melt (all projections relative to sea level in the year 2000):

- Sea level will rise around Hawai`i between 0.7 and 1.5 feet by 2050.
- The Intermediate (mid-range) estimate is for a rise of 1.0 feet by 2050.
- Sea level will rise between 1.3 and 8.0 feet by 2100.
- The Intermediate (mid-range) estimate is for a rise of 3.9 feet by 2100.

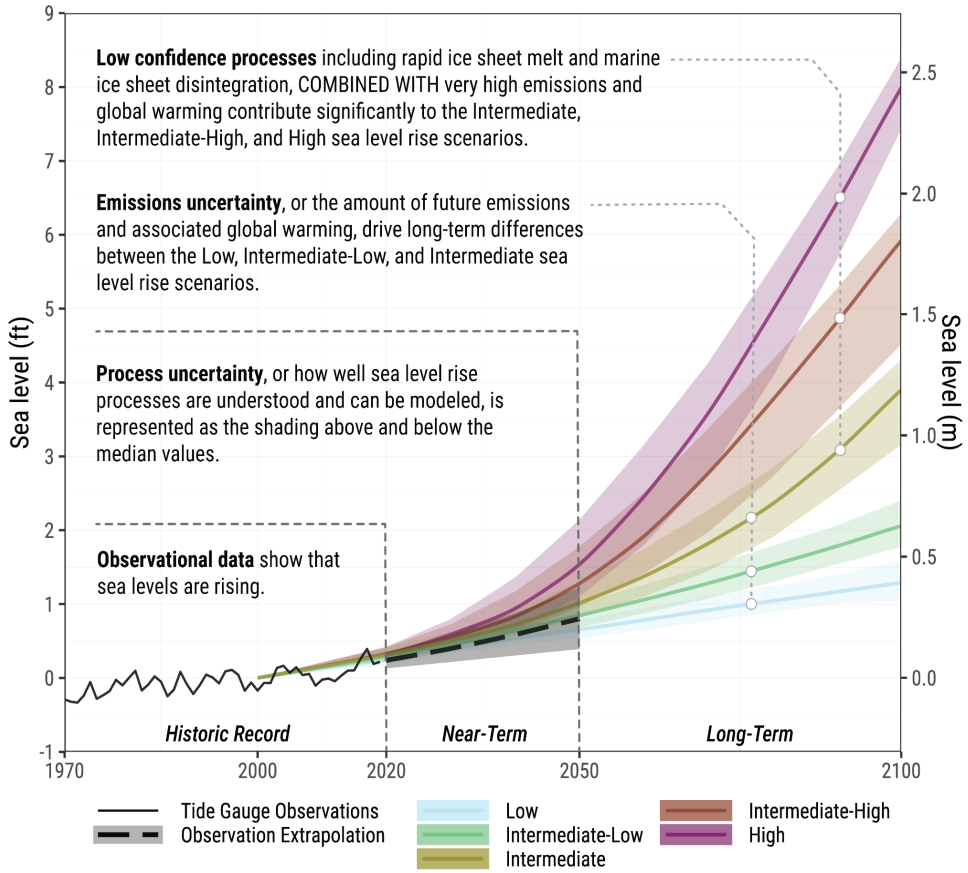


Figure 2. Sea level rise observations (solid black line), extrapolated observed trend (dashed black line), and sea level rise scenarios Hawai`i from NOAA interagency sea level rise report (Sweet, et al. 2022). The text in the figure

describes the various processes and uncertainties that contribute to the various sea level rise scenarios (Figure by Jamie Carter, NOAA).

	Year	
Scenario	**2050**	**2100**
Low	0.7	1.3
Intermediate-Low	0.9	2.0
Intermediate	1.0	3.9
Intermediate-High	1.3	5.9
High	1.5	8.0

Units in feet relative to year 2000

Table 1. Sea level rise scenarios for 2050 and 2100 for Hawai`i from interagency report (Sweet, et al. 2022).

In a study by researchers at the University of Hawai`i Sea Level Center and others, it was reported that rapid increases in tidal flooding are expected to begin locally by the mid-2030's (Thompson, et al. 2021). This increase will be the result of ongoing sea level rise in combination with natural cyclicity in tidal amplitudes, i.e., natural variations in the highest high tides. By the early 2040's Honolulu is projected to experience 2 to 3 high tide flood days per month considering NOAA's intermediate SLR scenario. However, such high tide events will be clustered over times of the year when tides are at their peak (i.e., during "king tides"), in which as many as 6-14 days per month can be expected. Thus, researchers recommend that compound flood impacts during these more extreme periods of tidal flooding be considered in flood management planning instead of annual averages (Thompson, et al. 2021).

Compound flooding describes flood sources that are additive to that generated by sea level rise alone. Compound flood sources can include the shallowing or emergence of coastal groundwater, rain events, and overwhelming of drainage systems that can ironically act as additional sources of floodwater. In a study that investigated proportions of flooding in Honolulu's Primary Urban Core caused by single, versus multiple components of sea level rise induced inundation, it was found that less than three percent was caused solely by direct overland connection to a rising ocean. Sources of compound flooding and exacerbation of such flooding by rising sea level should be a top consideration as part of ongoing research and flood management planning.

Local Observations of Coastal Impacts

The 2017 Report provided a detailed outline of the statewide results of the vulnerability assessment based on the outputs of the SLR-XA model and Viewer. Vulnerability was assessed in terms of potential impacts to land use, people, property, cultural and natural resources, and critical infrastructure. This section provides an overview of the observed local impacts since 2017 to inform the application of the SLR-XA to current and future planning efforts. This report does not include an updated assessment of the potential economic loss or impacts on people, roads, other infrastructure and ecological features within the SLR-XA. Such analyses will be included as part of planned updates to the Report and Viewer.

As was identified in the 2017 Report, chronic coastal flooding within the SLR-XA is an ongoing problem. The consequences of elevated sea level have already become apparent. In 2017, and again in 2020, the Honolulu Harbor Tide gauge recorded its highest daily mean water levels observed over its 112-year history. These record high water levels were produced by a combination of phenomena that included long-term global sea level rise, peak annual astronomical tides ("king tides"), wave setup, and migration of warm buoyant waters brought in by winds and currents. These events provide a glimpse of what will become a more regular occurrence as sea level continues to rise. Local impacts were observed throughout the State in the form of increased coastal erosion, minor wave over-wash flooding, backshore flooding from groundwater rise and storm drain backflow, and impeded and potentially hazardous beach access.

In addition to the observed coastal flooding, elevated water levels and recent extreme rainfall events have spurred concern regarding the functionality of municipal drainage systems, especially across heavily developed low-lying areas. Drainage systems in these areas were designed to convey stormwater from higher elevation to lower elevation waterways. As sea level rises, differences in these elevations have become reduced, and at times reversed, such that drainage systems are becoming increasingly inundated even in the absence of rainfall. Additionally, it is typical for these systems to feature cracks that can allow surrounding elevated groundwater to enter, further reducing drainage capacity. Reverse flow of stormwater is commonly observed in locations like Mapunapuna and Waikiki on O`ahu. Present drainage issues illustrate the fact that coastal flooding will increasingly be generated by a variety of flood sources including the contribution from stormwater conduits, particularly during heavy rainfall events.

The progressive impacts of sea level are likewise evident in the form of chronic coastal erosion. As expected, such erosion has continued along the majority of the State's coastlines, resulting in degradation of public access and nearshore infrastructure. Coastlines along West Maui and O`ahu's North Shore have become particularly stricken by the loss of coastal public trust lands and damage to backshore assets. An aggressive episode of coastal erosion in early 2022 critically undermined one single family home, leading to its collapse and deposition of dangerous debris along Pupukea Beach Park. The collapse followed four years of a progressively worsening combination of chronic and seasonal erosion between Rocky Point and Sunset Beach Park in Paumalu that has become a focal point, highlighting the need for improved management and retreat strategies. In West Maui, chronic erosion along stretches of Ka`anapali and Kahana have spurred the development of several beach and dune restoration projects with the goal of serving as natural buffers to ongoing erosion. Similarly, the degradation of coastal areas along West Maui has become a flashpoint for debate regarding public access rights to public trust

resources, private property rights, and environmentally appropriate coastal management strategies. Seasonal erosion along Ka`anapali in Summer 2022 exceeded recent historical records, revealing derelict erosion control efforts such as sandbags and highway barriers placed during the summer of 2007. The 2022 summer erosion resulted in the loss of trees and undermined the concrete beachwalk. Although the area is experiencing seasonal recovery, the shoreline has migrated mauka and similar erosion events can be expected in the future.

The impacts of coastal erosion on the state highway system are also significant. Hawai`i Department of Transportation (HDOT) Highways is proposing revetments in at least two locations along the Kamehameha Highway on O`ahu to protect the threatened roadway. On Maui, HDOT-Highways proposes to move portions of Honoapi`ilani Highway inland as a sea level rise adaptation. HDOT-Highways is also exploring the use of sand-savers and a revetment to protect against future erosion events in Wailua, Kaua`i and along the Windward O`ahu coastline.

Viewer Updates and Guidance Documents

The State of Hawai`i Sea Level Rise Viewer (Viewer) is the online atlas that supports the 2017 Report. The Viewer is designed to be useful for policy makers, government officials, and the public. There is an ongoing effort to refine the Viewer to continually provide the best available information to the users and stay in line with current science, observations, and projections. This section provides an overview of updates made to the Viewer to-date and modeling upgrades in progress to further refine the information provided by the Viewer.

In November 2018**,** the disclaimer text was updated in the Report and Viewer with the State Climate Commission's approval, stating that "having gone through peer review and publication in the Nature Journal Scientific Reports, the results of this study are sufficiently validated to be appropriately used in land management decisions as the best available information…"

In 2020, the State published the **Sea Level Rise Report Addendum: Guidance for Using the Sea Level Rise Exposure Area in Local Planning and Permitting Decisions as a** supplement to the 2017 Report. The Addendum was prepared by the University of Hawai`i Sea Grant College Program with the Hawai`i Department of Land and Natural Resources - Office of Conservation and Coastal Lands for the Hawai`i Climate Change Mitigation and Adaptation Commission - Climate Ready Hawai`i Initiative. The Hawai`i Climate Change Mitigation and Adaptation Commission issued a statement of approval for the Addendum at its October 28, 2020 meeting.

The primary purpose of the Addendum is to assist state and county planners, natural resource and infrastructure managers, and others with understanding and using the Sea Level Rise Exposure Area (SLR-XA) from the Report and Viewer in day-to-day planning and permitting decisions, particularly at the project or property-level scale. This guidance was developed in response to requests from county planning departments and other stakeholders to provide information on how to appropriately interpret and apply the SLR-XA map data in land use planning and permitting decisions while increasing understanding of the methods, assumptions, and limitations of the data.

Within the Viewer, several updates to the supporting text and available layers were completed since 2017 with the goal of making the tool more accessible and useful to users:

- An address and TMK search tool and a TMK Parcels boundary layer were added in response to the Disclosure Requirement for Residential Real Estate in the Sea Level Rise Exposure Area . These updates were made as a result of discussions with the Hawai`i Realtors Association to enable meaningful implementation of the requirement beginning in May 2022.
- A passive flooding exposure layer at 6 feet of sea level rise from NOAA was added in support of planning guidance to consider greater than 3.2 ft of sea level rise for critical infrastructure.
- Layers depicting moku and ahupua`a boundaries were added to support visualization and understanding of sea level rise hazards in a community and cultural context.
- A 1%-Annual-Chance Coastal Flood Hazard Zone with Sea Level Rise layer from the Hawai`i State Hazard Mitigation Plan was added to depict changing coastal flood hazard risks with less frequent but more severe storm and wave events
- A Land Use Districts layer was added in support of community planning for sea level rise.
- The text within the section titled "Sea Level Rise Projections for Modeling" was updated with the latest science.
- Text describing Assumptions and Limitations for the SLR-XA and three component models: Passive Flooding, Annual High Wave Flooding, and Coastal Erosion were added to improve understanding and transparency.

As sea level rise science and projections continue to evolve, the Viewer will be updated to incorporate new data and subsequent model outputs. The Coastal Erosion exposure map data in the Viewer was updated for Kaua`i, O`ahu, and Maui in 2020 by the University of Hawai`i Coastal Geology Group. However, the combined SLR-XA was not updated accordingly. A timeline and outline for implementation of a fully updated version of the Viewer is included in the Next Steps and Future Recommendations Section at the end of this report.

The Viewer was updated to provide specific local data for West Maui in the West Maui Wave Flooding Tool and Wave Runup Forecast Tool.

In addition to the Viewer, the State has published other related guidance and tools building on the 2017 Report. These efforts are listed below:

- **State of Hawai`i Climate Adaptation Portal - HI Adaptation site**: https://climate.hawaii.gov/hi-adaptation/
- **Sea Level Rise Guidance Tool**: interactive web-based guide to incorporate sea level rise considerations into planning and permitting: https://climate.hawaii.gov/hi-adaptation/sea-level-rise-viewer-flowchart/
- **Guidance for Addressing Sea Level Rise in Community Planning**: This project led by Hawai`i Sea Grant in partnership with Hawai`i Department of Land and Natural Resources (DLNR) and Office of Planning & Sustainable Development - Coastal Zone Management Program (OPSD-CZM) worked with state and county government to produce a guidance document and conduct outreach to address sea level rise and coastal hazards in the county general and community planning process: https://seagrant.soest.hawaii.edu/resources/program-publications
- **Guidance for Disaster Recovery Preparedness in Hawai`i**: This project led by Hawai`i Sea Grant in partnership with Hawai`i DLNR and OPSD-CZM worked with state and county government to

establish resilience-focused recovery practices before a disaster hits to enable communities to recover quickly while also adapting to sea level rise and protecting sensitive coastal environments through recommended preparedness activities and model planning and policy resources: https://seagrant.soest.hawaii.edu/resources/program-publications

- **Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i**: This report by OPSD-CZM examined managed retreat programs that have been successfully implemented in post-catastrophic events and in response to chronic coastal hazards and reviewed if and how the programs may be applied to Hawai'i. The assessment identified next steps and key questions to further understanding of how to implement retreat: https://planning.hawaii.gov/czm/ormp/ormp-action-team-project-on-the-feasibility-of-managed-retreat-for-hawaii/
- **Hawai`i 2018 Hazard Mitigation Plan**: The 2018 update of the State's Hazard Mitigation Plan includes expanded consideration of climate change and sea level rise hazards, including hazard assessment using the SLR-XA and a 1% Annual-Chance Coastal Flood Zone with 3.2 feet of sea level rise (1%CFZ-3.2) modeled for the Plan: https://dod.hawaii.gov/hiema/sert-resources/hazard-mitigation/

Review of 2017 Recommendations

The 2017 Report included nine recommendations with 49 recommended actions to achieve the desired outcomes. The recommendations were focused on improving our capacity to address the social, economic, and environmental impacts of sea level rise. Over the past 5 years, the legislature and various state and county agencies undertook several initiatives which align with the recommendations and goals set out in the 2017 Report. This section provides an overview of the status of those recommendations and associated recommended actions. Several of the initiatives are in progress or are ongoing efforts to continually adjust and address the threats of sea level rise and coastal erosion. In many cases, an initiative may address more than one recommendation or recommended actions. In those cases, the initiative is listed under each recommended action it addresses to give a complete picture of the state's progress towards meeting the goals of the 2017 Report.

Each recommendation and recommended action listed here will be noted with either a description of how it has been addressed, the ongoing efforts to address it, or flagged as unaddressed. All existing recommendations should be continued to the 2027 Report, with a few updates as detailed in the Further Recommendations Section towards the end of this report. The 2017 Report contains detailed descriptions and reasoning for each recommendation; readers can refer to that report for further information regarding the purpose and goal of the recommendations. This Report does not provide an assessment of the reduction in vulnerability as a factor of exposure, sensitivity, and adaptive capacity in response to the actions taken.

Progress Towards Meeting 2017 Recommendations:

A summary of the progress towards meeting the recommendations and recommended actions is presented here as measured on a qualitative scale of "no known progress" to "significant progress" as depicted by the following key:

1.1 Recognize the SLR-XA as a state-wide vulnerability zone: The State has not officially adopted SLR-XA as a statewide vulnerability zone but has made a number of important steps including the following:

- The Hawai`i Climate Change Mitigation and Adaptation Commission adopted the Hawai`i Sea Level Rise Vulnerability and Adaptation Report (and recommendations therein) and the Hawai`i Sea Level Rise Viewer following their completion in December 2017, recognizing the SLR-XA as a statewide vulnerability zone.
- The State Climate Commission adopted Recommendations for Countering Impacts of Sea Level Rise (September 2018) including the following recommended strategies:
  - Support legislation for disclosure for private property and public offerings located in areas with potential exposure to sea level rise.
  - Request all new development, redevelopment and modifications be directed away from beach areas.
  - Urge counties to incorporate the 3.2 ft. sea level rise exposure area (SLR-XA) into their general and development plans.
  - Encourage agencies and non-governmental utility providers to identify and prioritize assets within the 3.2 ft SLR-XA or more as described in the State's Sea Level Rise report, identify adaptation measures, and to provide a status update on this activity annually to the Climate Commission.
  - Support legislation that funds State programs to meet mitigation goals, and to bring resources to assist in planning and implementation for sea level rise and other climate related impacts.
- Honolulu Mayor Directive 18-02 (July 16, 2018) requires all City departments to use the most current versions of the City Climate Change Commission's Guidance and accompanying Brief, and the 2017 Report and associated Hawai`i Sea Level Rise Viewer as resources for managing assets, reviewing permitting requests, and assessing project proposals
  - City Climate Change Commission Sea Level Rise Guidance (2017, updated in 2022) builds on findings of the 2017 Hawai`i Sea Level Rise Report and recent scientific literature to provide specific policy and planning guidance on responding to sea level rise by the City.
- A Maui Mayoral Proclamation (February 22, 2018) directs County departments to use the 2017 State Sea Level Rise Report, Viewer, and SLR-XA in their plans, programs, and capital improvement decisions.

- County of Kaua`i incorporated SLR-XA into West Kaui`i Community Plan

1.2 Seek opportunities to plan new development outside of the SLR-XA under long-term, comprehensive managed retreat strategy

- OPSD-CZM published a report titled *Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i* in 2019 and is embarking on a next-step study that will assess the options for and implications of implementing managed retreat from the perspecives of (1) policy and regulation, and (2) funding and finacing mechanisms in 2023.
- Act 223, SLH2022 expands the authority of the counties to transfer development rights to address areas at risk of sea level rise, coastal erosion, storm surge, or flooding associated with climate change.
- The 2022 Draft update to the City and County of Honolulu Primary Urban Center Development Plan includes a Sea Level Rise and Coastal Hazards Planning Chapter and states Goal SLR-2: Conduct Long-Range Planning to Increase Area-Wide Adaptation and Resilience; Policy SLR 2.1: Plan for priority growth areas outside of the 3.2' SLR-XA and 6' SLR, and vent proposed solutions for highly impacted areas with the community.
- Bill 10 (2022) currently before the Honolulu City Council, Relating to Use Regulations would further expand the authority of Honolulu City and County to use transfer of development rights to support retreat from areas at risk of flooding and coastal erosion.
- Molokai Molokai Climate Change and Sea-Level Rise Adaptation and Resiliency (CCSLAR) Master Plan is a community-led climate change & sea-level rise plan for Molokai's future. Our overarching goal is to develop a Climate Change and Sea Level Adaptation and Resiliency (CCSLAR) Plan that best serves our Molokai community. It identifies areas at risk from sea level rise and areas for potential relocation.
- West Maui Community Plan (effective January 31, 2022) Section 2 Policies, Goal 2.1 Ready and Resilient Systems includes the following:
  - 2.1.1 | Proposed Community Plan Amendments for new development on existing golf course land in Kā'anapali makai of Honoapi'ilani Highway should be approved only for existing shoreline development that is retreating inland because of impacts from sea level rise or other coastal hazards.
  - 2.1.2 | To minimize impacts from future coastal erosion, new permanent structures must be located landward of the State-recognized SLR-XA for coastal erosion, except a minimum buildable area must be provided. This restriction does not apply to structures needed as part of an approved beach restoration project or cultural project, such as loko i'a, and which must be evaluated on a case-by-case basis.
  - 2.1.3 | For redevelopment and new developments within the SLR-XA, developers must proactively: a. Coordinate with the Maui County Department of Planning and adjacent or nearby property owners to understand possible collective relocation of at-risk structures; b. Incorporate results of coordination into development plans by siting any new planned structures out of harm's way; c. Make efforts to not hold the County of Maui and State of Hawai'i liable for any and all future costs associated with maintaining or protecting the property developed within the SLR-XA, including costs associated with retreat, hazard mitigation, and cleanup costs to maintain the health of the nearshore marine environment from material debris originating from the ocean or from the

structures' own erosion; and d. Make efforts to waive the ability to ever request shoreline hardening for their property or project from the County of Maui or the State of Hawai'i.

- The County of Maui adopted a Managed Retreat Revolving Fund in 2022 to take effect in July 2023. The fund is intended to help Maui homeowners manage coastal erosion and address climate change. The fund will specifically support shoreline improvements and the in-land relocation of infrastructure owned by the county and private entities. The money will come from 20% of the county's transient accommodations tax.
- West Kaua`i Community Plan (adopted 2020)
  - Includes Objectives (page 65) to provide a higher elevation area for property owners with vulnerable homes to retreat to in the future via transfer of development rights or land swap opportunities and that evacuated land serves as a buffer against future coastal hazards.
  - Encourages new development outside of the SLR-XA through zoning amendments. Several implementation zoning amendments were also approved with the plan document. This included ZA-2020-9, which established a new special treatment district called "ST-Coastal Edge" in the CZO. The new district was implemented in all residential neighborhoods vulnerable to sea level rise and located makai of a public road. Any use, structure, or development permitted with or without a Use Permit in the Special Treatment Coastal Edge District shall mitigate impacts from coastal hazards.
  - Identifies managed retreat as a priority as reflected in Resiliency Policy #1: Adapt West Kauai's low lying neighborhoods for climate change impacts and lay the groundwork for managed retreat

1.3 Conduct an inventory of existing lands designated for urban use that are located outside of the SLR-XA and prioritize these areas for new development

- The 2022 Draft of the revised Primary Urban Center Plan for the City and County of Honolulu includes the following Growth and Development Policy Goal: Invest in long-term growth in commercial corridors and mixed-density neighborhoods outside of the Sea Level Rise Exposure Area (SLR-XA). The goal contains an action to identify and create a geographic catalog of underutilized sites. Share these infill opportunities with non-profit developers.

1.4 Strive to balance managed retreat strategies from vulnerable urban areas with preservation of agriculture and conservation lands by relying on state planning act policies and tools and the State Land Use Commission boundary review process.

- No known action.

1.5 Integrate sea level rise adaptation plans and policies into state, county and community plans

- Hawai`i Sea Grant with State DLNR and OPSD-CZM developed Guidance for Addressing Sea Level Rise in Community Planning in 2020 in conjunction with county planning departments.
- In 2021, Hawai`i Department of Transportation (HDOT) Highways Division released its Climate Adaptation Action Plan, exposure assessments, and hazard viewer.
- Statewide Transportation Planning Office (STPO) is developing the 2045 Hawaii Statewide Transportation Plan (HSTP), an overarching policy document to guide system

level and master plans for the three primary modes of transportation in Hawaii. Currently, the HSTP draft plan is undergoing review and the STPO is seeking public comment via online public survey to help better determine feedback on the strategies that can help to implement the goals and objectives of the HSTP. You may find out more information regarding the HSTP at https://arcg.is/1KmHSP and participate in the public survey at https://www.surveymonkey.com/r/J8RHRTT.

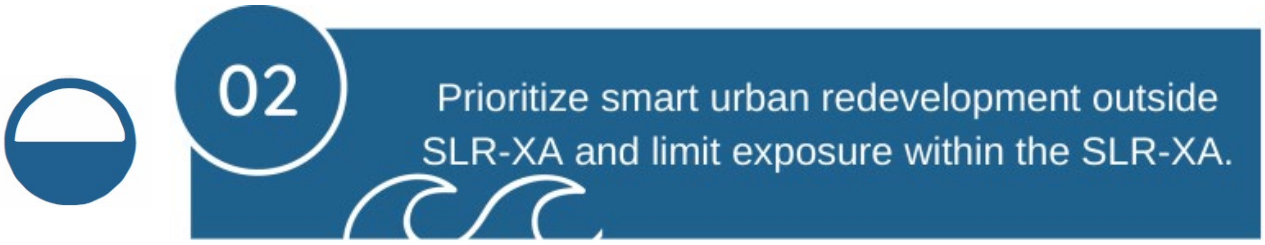
- The draft Department of Hawaiian Homelands (DHHL) General Plan, currently under final review, includes a Technical White Paper on Climate Change Impacts & Adaptation Planning with climate change adaptation strategies for sea level rise, erosion, and flooding. The draft General Plan incorporates climate change mitigation and adaptation concepts and measures into the agency's long-term vision, goals, objectives and policies, as well as DHHL's statewide land use designations, and proposes establishing overlays or other mechanisms that can be applied to areas subject to sea level rise and other climate-related hazards.
- The Hawai`i Department of Transportation (HDOT) published the Statewide Coastal Highway Program Report in 2019. The objective of the project was to develop a scientifically rigorous methodology to assess and rank the susceptibility of State of Hawaii coastal roads to erosion and structural degradation due to ocean hazards such as waves, currents, tides and sea level rise.
- HDOT's Act 100 Resiliency Report outlines the work HDOT is performing to incorporate resilience into its programs and projects.
- Draft Primary Urban Center Development Plan and North Shore Sustainable Communities Plan, currently in review from the Honolulu Planning Department include detailed consideration of sea level rise hazards with proposed actions informed by technical papers on climate change and sea level rise risks specific to the urban Honolulu and North Shore regions.
- East Honolulu Sustainable Community Plan, updated in 2022, addresses sea level rise and SLR-XA in hazard planning, zoning and permitting.
- Ko`olauloa Sustainable Community Plan, updated in 2020, sets a policy for open space to be used to provide adequate shoreline setbacks that consider shoreline changes resulting from erosion hazards and rising sea levels, based on adopted projections of shoreline erosion rates and sea level rise. The Plan also prioritizes using best-available sea-level rise science as a basis for planning.
- West Maui Community Plan adopted into Ordinance by the Maui County Council in December 2021 includes detailed sea level rise considerations and policy guidance informed by community input and a Climate Change and Sea Level Rise Technical Resource Paper.
- South Maui Community Plan currently in review includes detailed consideration of sea level rise informed by a Climate Change & Hazards Resource Paper
- The draft Hawai`i County General Plan, currently in review, includes a section on Mitigating & Adapting to Hazards and Climate Change including sea level rise informed by the SLR-XA.
- West Kaua`i Community Plan (adopted in December 2020) includes detailed sea level rise vulnerability and adaptation considerations and recommendations informed in-part by a West Kaua`i Community Vulnerability Assessment.
- Waimea 400 Conceptual Master Plan, which is a master plan for the 417-acre parcel between Kekaha and Waimea that was purchased by the County of Kaua'i in 2019, integrates the principles of Adaptation Planning in anticipation of sea level rise, flooding,

groundwater intrusion and climate change impacts within the vulnerable areas of the property. Preliminary zones were created based on existing information on potential inundation and future flooding. Appropriate uses for the conditions of each zone were identified.

1.6 Develop shoreline protection, conservation, and restoration priorities and guidelines

- Act 16, SLH2020 updated the Hawai`i Coastal Zone Management Act (HRS Chapter 205A) in many ways including strengthening protections for beach and other coastal environments by specifically prohibiting private shoreline hardening structures and minimizing public shoreline hardening structures, including seawalls and revetments, at sandy beaches where they would interfere with existing recreational and waterline activities. Further, the legislature amended HRS §205A-46 to change the standard for a variance for private facilities to clarify that "a variance to artificially fix the shoreline shall not be granted in areas with sand beaches or where artificially fixing the shoreline may interfere with existing recreational and waterline activities unless the granting of the variance is clearly demonstrated to be in the interest of the general public…".
- Act 16, SLH2020 also updated HRS Chapter 205A to increase protections of "valuable coastal ecosystems, including reefs, beaches, and coastal dunes, from disruption and minimize adverse impacts on all coastal ecosystems." Underline indicates addition from the former language. Further, it now refers specifically to protecting "beaches and coastal dunes for: (i) Public use and recreation; ii The benefit of coastal ecosystems; and (iii) Use as natural buffers against coastal hazards…".
- DLNR-OCCL completed a statewide programmatic environmental assessment and is in the process of updating its permitting program for Small Scale Beach Restoration.
- The Division of Aquatic Resources is developing the Coral Reef Restoration Action Plan. This plan will designate specific areas throughout Hawai`i to prioritize long-term coral reef restoration efforts to address specific goals. One of these goals is shoreline protection. The State will rely on community input, intersections between coral reef health and economic valuations of coastal flood risk/hazard mitigation potential, and analyses of vulnerable coastal infrastructure as likely factors in deciding specific sites for shoreline protection focused coral reef restoration.
- The Hawai`i Department of Transportation (HDOT) published the Statewide Coastal Highway Program Report in 2019. The objective of the project was to develop a scientifically rigorous methodology to assess and rank the susceptibility of State of Hawaii coastal roads to erosion and structural degradation due to ocean hazards such as waves, currents, tides and sea level rise.
- HDOT's Act 100 Resiliency Report outlines the work HDOT is performing to incorporate resilience into its programs and projects.
- Ko`olauloa Sustainable Community Plan includes the following: "To the extent possible, acquire shallow developed beach-front lots which would be impractical to redevelop given existing zoning standards or wave hazard considerations in order to improve public access and lateral shoreline views along Kamehameha Highway".
- DHHL's draft So. Molokai Shoreline Erosion Management Plan (SM_SEMP), currently under review, assesses causes, identifies effective and sustainable shoreline erosion management strategies, and educates homestead communities on best practices and nature-based solutions. The SM-SEMP will enable DHHL to develop shoreline protection, conservation and restoration priorities and guidelines and work with its lessees to proactively plan for and better manage and mitigate sea level rise-related impacts.

- County of Maui Department of Parks and Recreation published the Maui Beach Park Vulnerability and Adaptation Study with shoreline adaptation strategies for 65 beach parks.
- The West Maui Community Plan includes goal 2.1.5 | Protect the shoreline and beaches by preserving waterfront land within the SLR-XA as open space wherever possible.



2.1 Evaluate existing policies and institutional capacity of implementing smart redevelopment

- Act 208, SLH2022 expands the purpose and rationale for Special Improvement Districts to include financing of climate change and sea level rise adaptation.
- City & County of Honolulu Office of Climate Change and Resilience was established in the City Charter in 2017 increasing institutional capacity for coordinating actions and policies to improve community resilience to climate change and sea level rise impacts and integrating sustainable and environmental values into City plans, programs, and policies.
- County of Maui established an Office of Climate Change, Resiliency, and Sustainability in 2022 to increase capacity including through the ongoing development of a Climate Action and Resiliency Plan and Resilient Housing Guide.

2.2 Identify priority areas for smart redevelopment as part of a managed retreat strategy

- West Kaua`i Community Plan (adopted 2020) includes Objectives (page 65) to provide a higher elevation area for property owners with vulnerable homes to retreat to in the future via transfer of development rights or land swap opportunities and that evacuated land serves as a buffer against future coastal hazards.

2.3 Conduct a market study for priority redevelopment areas

- No known progress.

2.4 Develop detailed redevelopment strategies for priority areas and incentivize development

- West Kaua`i Community Plan (adopted 2020) includes an Objective (page 65) to Support a master-planned new community mauka within a Walkable Neighborhood designation to accommodate workforce housing, planned growth, and a potential sea level rise managed retreat area.
- The Waimea 400 Master Plan incorporates considerations of flooding and sea level rise in land use planning.

2.5 Update capital improvement planning to incorporate sea level rise and prioritize infrastructure improvements for priority redevelopment areas

- Act 178, SLH2021 requires OPSD, in cooperation with each state agency having operational responsibilities over state facilities, to identify existing and planned facilities that are vulnerable to sea level rise, flooding impacts, and natural hazards; assess a range of options to mitigate the impacts of sea level rise to those facilities. OPSD-CZM maintains a Story Map titled Sea Level Rise Adaptation in Hawai`i to track progress on meeting the Act 178 mandate.

2.6 Develop design standards for existing and proposed land uses that limits urban growth and increases flood resiliency within the SLR-XA

- Act 16, SLH2020 amended HRS § 205A-44 to ensure that permitted structures within the shoreline setback may not be rebuilt or replaced without a new variance. Specifically, it states that "permitted structures may be repaired, but shall not be enlarged, rebuilt, or replaced within the shoreline area without a variance."
- City and County of Honolulu released Climate Adaptation Design Principles identifying recommended tools and best practices to consider in designing building sites and structures to be resilient to sea level rise, flooding, extreme heat, and groundwater inundation.
- In October 2022, County of Kaua`i passed first of its kind Sea Level Rise Constraint District that uses passive flooding and wave runup models developed for Hawai`i Sea Level Rise Viewer. Using these modeled sea level rise hazards, the constraint district requires the elevation of at least two feet out of harm's way for residential structures and at least one foot out of harm's way for non-residential structures to limit the risk to public health and safety. The constraint district is a great example of resilient design standards for proposed uses within the SLR-XA.

2.7 Require the design and siting of planned new development and capital improvement projects to include an in-depth analysis of sea level rise impacts based on elevation, tolerance for risk, and lifetime of the structure

- The State Environmental Impact Statement Rules (HAR 11-200.1) were updated in 2018 to include consideration of location in the sea level rise exposure area in determining whether an action may have a significant effect on the environment. Environmental Impact Statements and Environmental Assessments must include SLR-XA maps as an indication of impact on the environment.
- The 2018 Kaua'i General Plan Policy 3.2C1 States: "In accordance with Hawai'i State Planning Act Priority Guidelines, consider multiple scenarios of SLR and associated flooding, wave inundation, and erosion impacts when developing and approving capital improvement projects."

2.8 Develop State and County guidance and a checklist for developers to assist with the integration of sea level rise in project design and encourage the use of best management practices for incorporating green and sustainable approaches in all stages of project development.

- City and County of Honolulu released Climate Adaptation Design Principles identifying recommended tools and best practices to consider in designing building sites and structures to be resilient to sea level rise, flooding, extreme heat, and groundwater inundation.

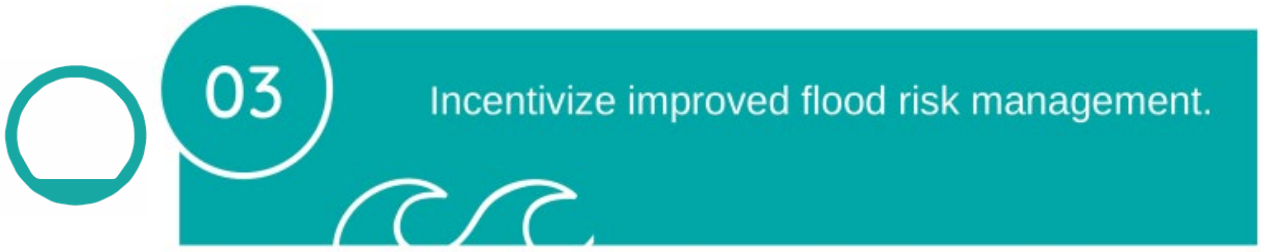
2.9 Develop guidance on integrating sea level rise and climate change in the environmental review process and incorporating environmental justice considerations

- Act 17,SLH2018 directed the environmental council to adopt and maintain rules pursuant to chapter 91, Hawai`i Revised Statutes, requiring all environmental assessments and environmental impact statements prepared pursuant to chapter 343, Hawai`i Revised Statutes, whether in draft or final form, to include consideration of sea level rise based upon the best available scientific data regarding sea level rise. Subsequent rules amendments incorporated the requirement.
- In November, 2019 the State Climate Commission released a Statement on Climate Equity which urges government entities in Hawai`i to Use a vulnerability framework that is appropriate for Hawai`i, and incorporate cultural responsiveness, reflect indigenous voices and customary law practices to identify any inequitable distribution of benefits, burdens and processes caused by climate change impacts and policy; and - Recognize and address the inequitable distribution of benefits, burdens and processes, by incorporating equity considerations into their planning, policy development and implementation for climate change mitigation, adaptation and resilience. For adaptation policies relating to sea level rise, such a framework should address equity issues surrounding access to information in the identification and prioritization of addressing the impacts of sea level rise on critical public infrastructure—such as roads, bridges, schools, hospitals, shelters and other structures. It poses the question: How will Hawaii's vulnerable communities provide input into policymaking that addresses the impacts of sea level rise?
- The State Environmental Impact Statement Rules (HAR 11-200.1) were updated in 2018 to include consideration of location in the sea level rise exposure area in determining whether an action may have a significant effect on the environment. Environmental Impact Statements and Environmental Assessments must include SLR-XA maps as an indication of impact on the environment.
- CZM's NOAA Coastal Fellow began her 2-year fellowship on August 1, 2022. The Fellow's project focuses on the nexus of coastal hazards and social vulnerability in Hawai`i and aims to better understand and identify communities with higher risk to coastal hazards due to socio-economic and demographic factors.

2.10 Integrate sea level rise vulnerability considerations into the Hawai'i Coastal Zone Management (CZM) Act

- Act 16, SLH2020 amended the Hawai`i Coastal Zone Management Act (HRS Chapter 205A) to further protect against impacts of sea level rise including adding sea level rise in the definition of "coastal hazards."
- Act 16, SLH2020 amended the Hawai`i Coastal Zone Management Act (HRS Chapter 205A) to further protect beaches by increasing the minimum shoreline setback in each county from 20 to 40 feet. Specifically, the legislature amended HRS § 205A-43 to mandate that shoreline setbacks throughout the state be "not less than forty feet inland from the shoreline."
- County of Maui and County of Kaua`i amended their shoreline setback ordinances to include a historical erosion rate-based setback. Updates are pending with the City and County of Honolulu, would update Revised Ordinances of Honolulu Chapter 23, relating to Shoreline Setbacks, to incorporate the 2020 CZMA amendments and implement a historical erosion-based shoreline setback formula on O'ahu (Bill 41, 2022).

Amendments to the Maui County ordinance to utilize a model-based erosion hazard line as the baseline for setbacks are pending.



3.1 Adopt higher flood standards to account for sea level rise

- The State of Hawai`i 2018 Hazard Mitigation Plan incorporated the results of modeling and an assessment of vulnerability to coastal flooding from storm-induced wave events with sea level rise. A 1%-annual-chance coastal flood zone with 3.2 feet of sea level rise was modeled to estimate coastal flood extents for wave-generating events including tropical storms, hurricanes, tsunamis, and other severe wave events with sea level rise and was added to the Hawai`i Sea Level Rise Viewer.
- County of Kaua`i adopted Bill 2879 to update the zoning ordinance to require the lowest floor of any new dwellings in the Sea Level Rise Constraint District be raised 2 feet above the highest sea level rise flood elevation as projected by the SLR-XA Viewer and associated Kaua`i SLR Constraint District Viewer. New, non-livable buildings need to be raised 1 foot above the flood elevation projection.

3.2 Consider adopting V zone construction standards in the Coastal A Zone

- No known action.

3.3 Provide technical and financial support to a state-wide Community Rating System program

- No known state-wide action
- County of Maui and County of Hawai`i are active Community Rating System (CRS) communities. Currently, flood insurance policy holders in the County of Maui benefit from a 15 percent reduction in their NFIP premiums due to Maui's proactive flood risk reduction measures. Residents of the County of Hawai`i already receive 10 percent reductions.
- County of Kauaii's status as an active CRS community is pending, an official announcement is expected in 2023

3.4 Encourage property owners at risk to coastal flooding to purchase flood insurance

- DLNR, FEMA and Hawai`i Independent Insurance Agents hosted a continuing education seminar on the National Flood Insurance Program (NFIP) for licensed insurance agents in August 2019.
- The City and County of Honolulu Office of Climate Change, Sustainability and Resiliency provides information flood risk and flood insurance on their Get Flood Ready website.

3.5 Incorporate sea level rise into state and county hazard mitigation plans

- The State of Hawai`i 2018 Hazard Mitigation Plan included expanded risk and vulnerability assessment for Climate Change and Sea Level Rise utilizing the SLR-XA data from the 2017 Report and Viewer.
- The 2020 Multi-Hazard Pre-Disaster Mitigation Plan for the City and County of Honolulu incorporates Climate Change, Sea Level Rise and coastal erosion into the vulnerability and mitigation planning.
- The 2020 County of Maui Hazard Mitigation Plan Update incorporates Climate Change, Sea Level Rise and coastal erosion into vulnerability and mitigation planning.
- The 2020 County of Hawai`i Multi-Hazard Mitigation Plan recognizes Climate Change, Sea Level Rise and coastal erosion into vulnerability and mitigation planning.
- The 2020 County of Kaua`i County Multi-Hazard Mitigation and Resilience Plan incorporates Climate Change, Sea Level Rise and coastal erosion into vulnerability and mitigation planning.

3.6 Adopt a state-wide program that supports the Building Code Effectiveness Grading Schedule(BCEGS) program for insurance rating

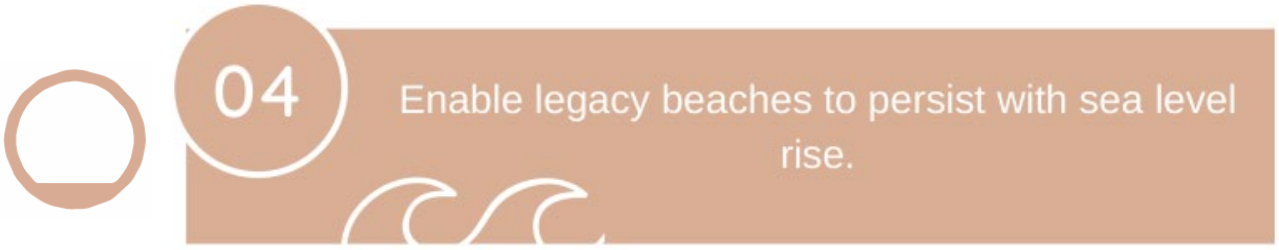
- HI-EMA conducting surveys of BCEGS eligibility ratings for each county - recently assessed Kaua`i County with a rating of 9, and currently assessing Big Island.

3.7 Develop pre-disaster recovery frameworks at state and county levels that incorporate opportunities to adapt to sea level rise through disaster recovery

- HI-EMA's 2020-2025 Five Year Strategic Plan recognizes development of disaster recovery frameworks as a key element in meeting preparedness goals.
- Honolulu Office of Climate Change, Sustainability, and Resilience has a current grant-funded project to develop a Long-Term Disaster Recovery plan and tools to help O`ahu organize and recover more quickly from a disaster.
- Hawai`i Sea Grant is in receipt of grant funding to assist County of Kaua`i develop a pre-disaster recovery plan beginning in 2023.

3.8 Perform a study to identify what other incentives could be utilized to promote improved flood risk management.

- No known action.



4.1 Conduct a state-wide assessment to identify legacy beach conservation priorities

- Act 16, SLH 2020 updated the Hawai`i Coastal Zone Management Act (HRS Chapter 205A), including strengthening protections for beach and other coastal environments and prohibitions against seawalls and other coastal armoring.
- OPSD-CZM is conducting a Regional Shoreline Management Scoping Study (ongoing) to develop and outline a recommended approach that can help define regions and subregions for the purpose of improving shoreline management. The Scoping Study will explore strategies for utilizing environmental characteristics and conditions to define "regions" for the purposes of rethinking shoreline management across the state, with the intention of facilitating larger-scale, nature-based, comprehensive management strategies.
- DLNR-OCCL completed an statewide programmatic environmental assessment and is in the process of updating its permitting program for Small Scale Beach Restoration.
- The City and County of Honolulu adopted Ordinance 22-22 Relating to Indigenous Plants in Public Beach Parks prioritizing the use of appropriate indigenous plantings to enhance the health of beaches and dunes and enhance resilience.

4.2 Establish a "willing seller" program to move development away from legacy beaches

- OPSD-CZM published a report titled *Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i* in 2019 and is embarking on a next-step study that will assess the options for and implications of implementing managed retreat from the perspectives of (1) policy and regulation and (2) funding and financing mechanisms.in 2023.

4.3 Amend the State Legacy Lands Act to set aside funding for priority coastal lands and enable the use of a variety of practices and tools

- Legislation to amend the State Legacy Lands Act was considered but determined not to be the best mechanism for designating funds for coastal land acquisition. An update to this Recommended Action is detailed later in this report.

4.4 Expand the area of national, state, and county parks and wildlife refuges to preserve critical coastal wildlife habitats

- No known action.

4.5 Prioritize coral reef preservation to buffer the impacts of coastal hazards with sea level rise

- In 2021 SCR159, SD1 directed the following: "Department of Land and Natural Resources is urged to examine and consider purchasing reef insurance to support nature-based solutions to protect Hawaii's coastline and coastal infrastructure from natural disasters.". The Division of Aquatic Resources found reef insurance to be a

valuable financial tool because of its accessibility to both public and private sector funds and its ability to rapidly deploy money for reef resilience maintenance via emergency restoration. They also encouraged continued investigations into additional funding sources, as this is not the only financial tool for hazard mitigation utilizing nature-based solutions. Additional findings related to coral reef's role in coastal protection and sea level rise mitigation can be found in the Division of Aquatic Resource's Reef Insurance Feasibility Report.

4.6 Develop public-private partnerships for coastal land acquisition, beach management, and reef protection

- Act 208, SLH2022 expanded the purpose and rationale for Special Improvement Districts to include financing of climate change and sea level rise adaptation.
- Hawai`i Sea Grant published the Hawai`i Dune Restoration Manual in 2022. The manual is a resource for community groups, nonprofits, county and state agencies and departments, coastal resorts and condominiums, coastal landowners and managers, and anyone interested in conducting proactive dune restoration projects in partnership with Hawai'i Sea Grant community extension agents.

5.1 Develop an archipelagic-wide inventory of Native Hawaiian cultural resources and practices impacted by sea level rise

- OHA's Kipuka Database is a geographical information system (GIS) that utilizes the latest mapping technologies to provide a window into native Hawaiian land, culture and history. Kipuka links historic data sets to geographic locations reinforcing the concept of information embedded in the 'aina (land), encoded in the wahi inoa (place name). The foundation of Kipuka is the traditional land system, mokupuni divided into moku, ahupua'a, ili and kuleana. The mission of Kipuka is to create a repository of knowledge where information about Hawai'i's land, culture and history can be easily accessed, to develop a virtual mo'oku'auhau of land tenure in Hawai'i, and to provide an opportunity for individuals to forge new relationships between themselves and the 'aina (land) that is most important to them.

5.2 Work with Native Hawaiian Communities to develop a culturally-based adaptation process and protocols to preserve iwi kūpuna and Native Hawaiian cultural resources and practices with sea level rise

- The County of Kauai`i is engaged in developing an island-wide Climate Adaptation Plan.

5.3 Develop adaptation plans to preserve access to coastal lands and water within Native Hawaiian communities with sea level rise.

- No known action.

6.1 Identify hazard mitigation measures to address coastal flooding of hazardous material/waste storage facilities, underground storage tanks, and on site sewage disposal systems vulnerable to sea level rise

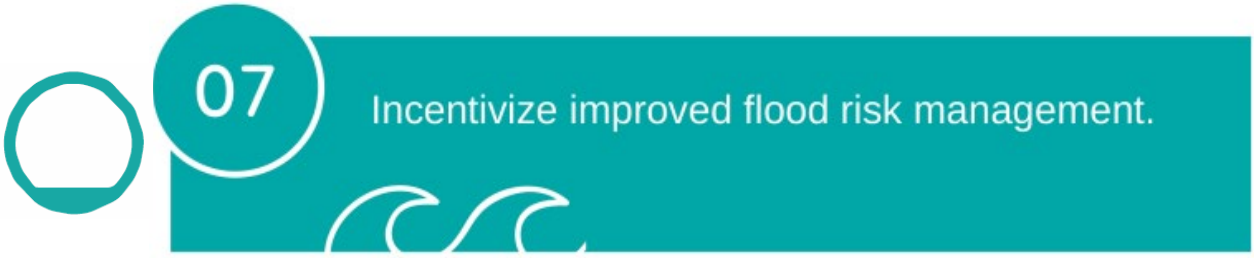
- Hawai`i Department of Health, Hazard Evaluation & Emergency Response Office released a memorandum in June 2021 describing how increased flooding, groundwater inundation and sea level rise resulting from climate change will increase risks to human health and the environment from chemical contamination.
- There are currently over 88,000 cesspools in Hawai`i and many of them are in the Special Management Area and located on beachfront properties. State has banned the construction of new cesspools and has required that all current cesspools be converted by 2050. Act 125, SLH2017 requires conversion of cesspools by 2050. Act 153, SLH2022 authorized development of a pilot program to assist low- and middle-income residents to complete the conversion.
- A state income tax credit is available for upgrading a cesspool to a septic or aerobic system or connecting to the sewer for cesspools located within 500 ft of the shoreline, a perennial stream or wetland, or within a source water assessment program area.
- The Department of Health (DOH) has been authorized by Act 132, SLH2018 to establish a cesspool conversion working group. The purpose of this working group is to develop a long-range, comprehensive plan for cesspool conversion statewide for all cesspools by 2050. The final report of the working group is due to the legislature prior to the 2023 session.
- During FFY 2022 approximately $12.3 million under the Base Clean Water State Revolving Fund (CWSRF) appropriation and $14.5 million under the Bipartisan Infrastructure Law (BIL) CWSRF appropriation will be allocated to the State of Hawai`i. The DOH Wastewater Branch is now prioritizing funding of wastewater projects that will support sustainable infrastructure to withstand the effects of rising Sea level due to climate change and provide adaptation for coastline innovation.

6.2 Review existing environmental regulations, guidance documents, and best management practices

- No known action.

6.3 Update guidance and propose legislative amendments to existing environmental regulations.

- No known action.



7.1 Conduct more detailed financial and economic analysis of sea level rise impacts in the SLR-XA

- No known action.

7.2 Develop a multi-pronged financing strategy at federal, state, county, private sector, and philanthropic levels to address costs of adaptation to sea level rise

- Act 208, SLH2022 expands the purpose and rationale for Special Improvement Districts to include financing of climate change and sea level rise adaptation.

7.3 Require mandatory disclosure for private properties and public offerings located in areas with potential exposure to sea level rise

- In 2021, the State of Hawai`i enacted an update to the Mandatory Seller Disclosures in Real Estate Transactions Law, codified within Hawai`i Revised Statutes §508D-15, requiring that real estate transactions within the State must disclose any risk of sea level rise (up to and including the 3.2-feel sea level rise scenario) to the property. The Commission released a flyer regarding the Disclosure Requirement for Residential Real Estate in the Sea Level Rise Exposure Area in 2022 to assist real estate agents and homeowners effectively navigate the new law. The promotional materials include information on how to identify whether a property is at risk, what the potential risks are, and how to use the Hawai`i Sea Level Rise Viewer.

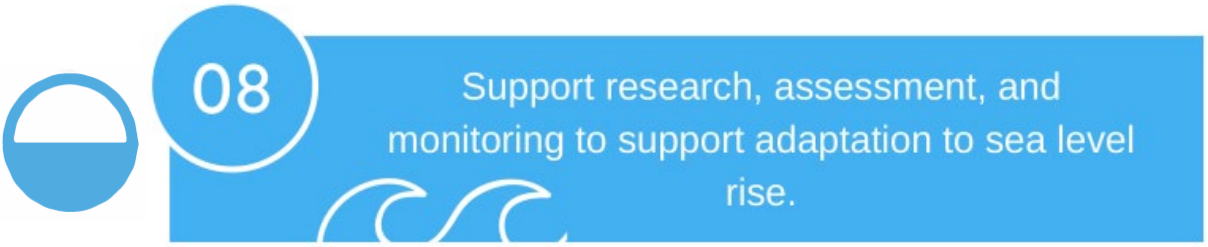
7.4 Explore the use of transfer of development rights and purchase of development rights programs that facilitate managed retreat and legacy beach preservation

- Act 223, SLH2022 expands the authority of the counties to transfer development rights to address areas at risk of sea level rise, coastal erosion, storm surge, or flooding associated with climate change.
- Honolulu City Council is considering a bill (Bill 10, 2022) with proposed updates to the Land Use Ordinance relating to transfer of development rights from properties within the special management area (SMA) to a location outside the SMA is in discussion in the City Council.

7.5 Consider the feasibility of a buy-out program for residential property owners vulnerable to sea level rise

- In February 2019 OPSD-CZM released a report titled *Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i*. The report determined that at time of writing, it was unrealistic to develop a step-by-step plan to implement managed retreat areas in Hawai`i threatened by sea level rise, given

a variety of unknowns and competing priorities. Instead, the assessment reports findings regarding retreat programs and their relative significance to Hawai`i and a specific multi-prong recommendation regarding the feasibility of retreat in Hawai`i.



8.1 Update coastal hazards modeling and vulnerability assessment as needed based on new climate science, sea level rise projections, and methods

- Ongoing updates to the modeling for the SLR-XA Viewer are outlined in the Updates to the 2017 Report and Viewer above and in the Next Steps section at the end of this Report.
- In 2022 HDOT Highway's released an Asset and Hazard Map that lets users explore the intersection of transportation infrastructures and climate hazards across Hawaii.
- In 2021 Pac IOOS released a Wave Runup Tool for West Maui and theWest Maui Wave Flooding Tool to provide specific information for the region.
- County of Maui developed the Maui County Beach Park Vulnerability Tool.

8.2 Engage communities in monitoring the impacts of sea level rise

- Hawai`i Sea Grant sponsors the Hawai`i and Pacific Islands King Tides citizen science program to enable individuals to contribute to the documentation of the impacts of King Tides to better understand tomorrow's impacts from sea-level rise and other coastal hazards.

8.3 Conduct in-depth assessment of vulnerability and evaluation of adaptation strategies for critical infrastructure throughout the State

- In 2021, the State's Thirty-First Legislature recognized that climate change and sea level rise "pose significant, dangerous and imminent threats to the State's social and economic well-being, public safety, nature and environment, cultural resources, property, infrastructure, and government functions and will likely have a disproportionate impact on low-income and otherwise vulnerable communities." Act 178, SLH2021 Relating to Sea Level Rise Adaptation was passed to begin the long-term planning needed to effectively address climate impacts. The purpose of this Act is to: (1) Require the OPSD, in coordination with state agencies with operational responsibilities over state facilities, to: a. Identify existing and planned facilities that are vulnerable to sea level rise, flooding impacts, and natural hazards; b. Assess options to mitigate the impacts of sea level rise to those facilities; and c. Submit annual reports to the Governor, Legislature, and the Hawai`i Climate Change Mitigation and Adaptation Commission regarding vulnerability and mitigation assessments for state facilities and progress toward implementing sea level rise adaptation in future plans, programs, and

capital improvement needs and decisions. (2) Update and reaffirm the role of the OPSD to coordinate climate change adaptation and sea level rise adaptation among all state agencies to improve the interagency coordination of these activities; and (3) Amend the Hawai`i State Planning Act to include sustainable development, climate change adaptation, and sea level rise adaptation as objectives for facility systems.

- OPSD-CZM released a 2021 Annual Report for Act 178, SLH2021. The report describes OPSD's activities and progress related to the implementation of Act 178, Relating to Sea Level Rise Adaptation, including a discussion on the findings of an initial state facility inventory and exposure assessment, considerations for future assessments, and recommendations for next steps. The report identifies a three phased approach: 1) conduct a high-level inventory of state facilities vulnerable to sea level rise; 2) conduct a vulnerability assessment of facilities in order to prioritize needs; and 3) identify a suite of mitigation and adaptation strategies for vulnerable facilities.
- OPSD-CZM is developing a Menu of Coastal Hazard Adaptation Strategies Suitable for Hawai`i Coastlines. The project deliverable is a comprehensive, informational resource that outlines potential coastal adaptation strategies. Each strategy will have its own "Strategy Info Card" which highlights the strategy's pros and cons, appropriate site conditions, potential permits, etc. The project is scheduled to be completed by November 2022.
- OPSD-CZM is developing a Regional Shoreline Management Scoping Study. This scoping study is an exploratory step towards a regional shoreline management strategy for the State of Hawai`i. Current shoreline management is done at the parcel level which often leads to "harder" adaptation solutions. This study will result in a proposed methodology for defining "coastal regions and subregions" that considers environmental and land use factors. The project is scheduled to be completed by December 2022.
- Hawai`i Sea Grant, University of Hawai`i Department of Urban and Regional Planning, and County of Kaua'i conducted a 2-year community-based vulnerability assessment for climate change and sea level rise on West Kaua`i using the decision support tool: Vulnerability, Consequences, Adaptation, Planning Scenarios or VCAPs. The assessment covered 6 management concerns and profiled 5 towns. This involved mapping of exposed community assets, and 7 four-hour workshops with the community. All the community participants combined resulted in over 100 hours sharing important information on how West Kaua`i is vulnerable to sea level rise, and options for adaptation. The final report was produced in June 2020. The County of Kaua`i incorporated the results of the WKCVA into the West Kaua`i Community Plan, a land use and policy document for the west side, which was adopted in 2020.

8.4 Develop a sea level rise research, assessment, and monitoring agenda to support the 5-year update process

- The Climate Resilience Collaborative (CRC) is a research program at the University of Hawai`i at Mānoa, School of Ocean and Earth Science and Technology, that is funded through the Office of Naval Research and led by Dr. Chip Fletcher. CRC is an affiliation of researchers, technicians, modelers, architects, attorneys, economists, planners, and undergraduate and graduate students spread across the Mānoa campus working on challenges related to climate change. CRC personnel conduct investigations of sea level rise and community design, increasing resilience to extreme weather events, projecting future climate stresses and shocks, marine and reef impacts, and better understanding

community exposure to rising heat, storms, and drought. This requires cross-disciplinary and integrated research investigation on a range of spatial and temporal scales.

9.1 Develop sea level rise adaptation priorities for the Hawai`i Climate Commission

- The Hawai`i Climate Commission adopted Recommendations for Countering the Impacts of Sea Level Rise in September, 2018.

9.2 Continue to support the Office of Planning and DLNR-OCCL to provide leadership, technical support, education and outreach, and interagency coordination to the Hawai`i Climate Commission and other stakeholders for sea level rise

- Working closely with the OCCL Administrator, Hawai`i Climate Mitigation and Adaptation Commission Coordinator, and planning staff at the DLNR-OCCL through cooperative funding agreements, University of Hawai`i Sea Grant extension specialists aid the DLNR-OCCL and partner State and county government agencies in making sound, science-based decisions promoting responsible and proactive coastal land use planning and coastal zone management and assist the DLNR with its climate change and sea level rise adaptation efforts.
- The 2020 Ocean Resources Management Plan: Coastal Zone Management Mauka to Makai provides guidance for a focused effort to improve State policies for ocean resources by addressing management gaps in the State. Within the focus area of Development and Coastal Hazards, the Plan identifies community action opportunities, main entities in the action team, and recommendations for stakeholders to consult. The Plan also lists out proposed projects and initiatives addressing this focus area, based on closing identified management or knowledge gaps. The ORMP's Coordinated Working Group, program managers representing a variety of agencies at the state, county and federal levels, meet quarterly to exchange information and build collective knowledge.
- OPSD-CZM worked with the USACE to officially establish the Hawai`i Silver Jackets Team in 2021. The Team's first initiative, approved in 2022, is to develop a framework for decision-making along Hawaii's shorelines. Actions planned through this proposal include identification of specific decision-making roadblocks and possible resolutions through 1) review of state and county regulations & 2) proposed revisions to facilitate consistent land use decisions that ensure the inclusion of current and projected environmental conditions, coastal hazard risks, and types of development. CZM will collaborate with county planning departments, OCCL, HI-EMA, NOAA OCM and USACE. The proposal is designed to obtain alignment of agency responses to chronic coastal hazards and provide homeowners/developers/planners with predictability on what mitigation strategies are acceptable. The Silver Jackets team acknowledges that this proposal may not allow for resolved decision-making for all of Hawaii's diverse coastal

geologies, hydrodynamics, and development patterns and will work collectively towards identifying highest priority typologies.

- 9.3 Develop a multi-agency, multi-media, and multi-stakeholder education and outreach program as part of a long-term commitment to building an informed and active constituency on climate change mitigation and adaptation
    - The Hawai`i Climate Change Portal hosted by the Climate Commission hosts a consolidated inventory of climate adaptation and mitigation documents and tools.

- 9.4 Develop a monitoring and evaluation plan with benchmarks and indicators to support the 5-year update process
    - No known action.

Further Recommendations and Next Steps

As we continue to make progress towards achieving the recommendations set forth in the 2017 Report, we must also focus on realigning our path and goals to continue to progress over the next five years. This includes proposing updated recommendations to guide State and County Agencies in continued planning and implementation of sea level rise related adaptation and mitigation efforts, as well as identification of new and unmet needs. Together, the updated recommendations and identification of unmet needs present a roadmap for bridging to a next-generation State of Hawai`i Sea Level Rise Viewer and a comprehensive update to the Hawai`i Sea Level Rise Vulnerability and Adaptation Report in five years.

Recommendations

The accomplishments achieved since 2017 provide a solid foundation for continued action for the state to meet the challenges and impacts of sea level rise. All 2017 recommendations and recommended actions should be continued over the next five years, with some minor edits and additions as outlined below. This report includes new recommended actions that align with existing recommendations from the 2017 Report and updates to some 2017 recommended actions.

This section presents the following:

- Two new recommendations, labeled as **2022 Recommendations,** with associated Recommended Actions, labeled as **2022 Recommended Actions**,
- One updated 2017 Recommendation, labeled as **Updated 2017 Recommendation** with three associated updated 2017 Recommended Actions, labeled as **Updated 2017 Recommended Actions,** and
- Thirteen new Recommended Actions aligned with 2017 Recommendations, labeled as **2022 Recommended Actions**.

2022 Recommendation 1: Conduct a full update of the Sea Level Rise Vulnerability and Adaptation Report in 2027.

- 2022 Recommended Action 1.1: Develop a next-generation State of Hawai`i Sea Level Rise Viewer and complete a more extensive update of the Hawai`i Sea Level Rise Vulnerability and Adaptation Report in 2027 utilizing the latest and best-available climate change and sea level rise

scientific information and sea level rise exposure map data (e.g., Climate Resilience Collaborative at the University of Hawai`i). The state should allocate funding to complete a comprehensive report in 2027 with a focus on community-level impacts and actions and implementation of identified adaptation recommendations from 2017. This recommendation builds on the existing mandate for a review and update every five years by proposing that the 2027 Report include a full vulnerability assessment and documentation of ongoing initiatives to reduce vulnerability and increase resiliency and adaptation. Contracting and drafting for the 2027 Report should begin at least two years in advance of the reporting deadline mandated by Act 32, SLH2017. Current progress towards developing the next-generation Sea Level Rise Viewer is detailed in the Next Steps Section, below.

- 2022 Recommended Action 1.2: Develop a centralized tracking system to coordinate all efforts that are responsive to the 2017 and 2022 Report Recommendations. Establish a position within DLNR, in coordination with the Climate Commission, to improve cooperation and coordination between State and county agencies for all issues relating to sea level rise mitigation and adaptation, and to raise the visibility and understanding of these efforts to the public and across the state and county government agencies. The state should create a reporting tool potentially housed by the State Climate Commission, to consolidate reporting of progress towards meeting the objectives and recommendations of the 2017 Report and this Update. Ongoing accounting for the initiatives and progress from state and county agencies will enable greater visibility between agencies and will support the completion of the 2027 Report. This Recommended Action also aligns with 2017 Recommended Action 9.4 Develop a monitoring and evaluation plan with benchmarks and indicators to support the 5-year update process.
- 2022 Recommended Action 1.3: Identify emerging issues and unmet needs for sea level rise adaptation and mitigation not addressed by the 2017 Report. State and county agencies, in coordination through the State Climate Change Commission, should review current and ongoing initiatives to determine unaddressed issues for consideration in the 2027 Report.
- 2022 Recommended Action 1.4: Conduct an updated and more detailed vulnerability assessment within the SLR-XA: As part of the 10-Year Update the state should conduct a full review of all actions taken in response to these recommendations and the 2017 recommendations to determine the changes in vulnerability within the SLR-XA as a factor of exposure, sensitivity, and adaptive capacity. The vulnerability assessment should include a detailed analysis of socio-economic factors including community sensitivity and adaptive capacity**.**

2022 Recommendation 2: Continue to implement the 2017 Recommendations with minor edits as outlined in the 2022 Report Update.

- 2022 Recommended Action 2.1: Identify gaps in progress since 2017. State agencies should work towards completing and where necessary, revising the recommendations from the 2017 Report with a particular focus on areas where significant progress is lacking in the past five years. The state should ensure that agencies are adequately resourced to implement programs and policies to address the increased risk of sea level rise.

2017 Recommendation 1: Support sustainable and resilient land use and community development

- Updated 2017 Recommended Action 1.1: Recognize the SLR-XA as a statewide exposure zone: The phrase “vulnerability zone” should be replaced with “exposure zone” to more accurately

reflect what the SLR-XA depicts. Vulnerability within the exposure area can be reduced through adaptation measures for infrastructure that cannot be moved. Although all infrastructure within the SLR-XA is vulnerable to sea level rise, several factors can impact the extent of vulnerability or resiliency.

- 2022 Recommended Action 1.7: Update planning guidance to reflect most recent sea level rise projections:
  Following the latest Sweet, et al., 2022 NOAA-interagency sea level rise report, the state should set a revised planning and policy benchmark of 4 ft as the minimum scenario for all planning and design based on the report's Intermediate (mid-range) scenario for Hawai`i of 3.9 feet of sea level rise by 2100, and apply a 6 ft benchmark for planning and design of public infrastructure projects and other projects with low tolerance for risk based on the report's Intermediate High scenario for Hawai`i of 5.9 feet of sea level rise by 2100. The latest science suggests that the SLR-XA for 3.2ft of sea level remains valid as a planning overlay for the mid century at this time. The State should continue to use the 3.2 foot Sea Level Rise Exposure (SLR-XA) and NOAA 6 foot passive flooding map data available in the Viewer until updated SLR-XA data is available. Agencies should incorporate the revised planning benchmarks into adaptation planning to account for the more accurate regional projections prior to the availability of revised SLR-XA data as possible. This recommendation is consistent with recent recommendations from the City and County of Honolulu Climate Change Commission which recommends an increase from 3.2 feet of sea level rise by 2100.
- 2022 Recommended Action 1.8: Implement the recommendations of the February 2019 Office of Planning and Sustainable Development - Coastal Zone Management Program report titled "Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i": The state should establish and fund programs at the state and county level to incentivize relocation (e.g., willing-seller managed retreat) to benefit community resilience and protect public trust resources. Such programs include the ongoing work to:
  - Expand the State's and counties' ability to implement voluntary managed retreat "tools" including but not limited to transfer of development rights (TDRs), rolling easements, and land transfers;
  - Review state and county land use to determine where it may be possible to retreat to, i.e, "receiving areas";
  - Engage communities to obtain their input and priorities for retreat location strategies;
  - Identify and establish federal, state, and county funding for retreat and restoration of coastal lands to natural conditions or lightly developed parklands for public benefit of conserving shoreline access and improving community resilience;
  - Review state and county plans to determine where they may be amended and updated to support retreat;
  - Review laws and regulations that may have to be amended and adopted to facilitate retreat;
  - Prioritize support for voluntary relocation of multi-generational shorefront landowners; and
  - Establish managed retreat pilot implementation areas.

- 2022 Recommended Action 1.9: Conduct long-term strategic planning for maintenance, repair and replacement of critical infrastructure within the SLR-XA in advance of emergent need: State

agencies should undertake long-term strategic planning initiatives to reduce the use of emergency measures for maintenance and repair of facilities and infrastructure within the SLR-XA. Emergency authorizations and implementation of adaptation measures reduce public input to the planning and permitting process. While immediate emergency action is sometimes necessary for public health and safety, it should not be used to circumvent public involvement. Proactive and comprehensive long-term planning for sea level rise impacts prior to emergency situations is necessary to safeguard natural resources while ensuring ongoing maintenance and potentially relocation of critical infrastructure. Accurate SLR-XA data available via the Viewer provides an advanced look at future sea level conditions and is a key planning tool for applying planning benchmarks outlined in this report.

2017 Recommendation 2: Prioritize smart urban redevelopment outside the SLR-XA and limit exposure within the SLR-XA

- 2022 Recommended Action 2.10.1 Incorporate existing and emerging scientific data in updates to shoreline setback ordinances: The state should support the counties in updating shoreline setback and zoning ordinances to reflect the increasing threat of coastal erosion and sea level rise.

2017 Recommendation 3: Incentivize improved flood risk management; Recommended Action 3.1 Adopt higher flood standards to account for sea level rise

- 2022 Recommended Action 3.1.1: Improve guidelines and regulations for planning and design in the SLR-XA and FEMA Special Flood Hazard Zones: Establish a position within DLNR, in coordination with the Climate Commission, to improve cooperation and coordination between State and county floodplain management and planning departments to integrate sea level rise considerations into floodplain management and hazard mitigation.
- 2022 Recommended Action 3.1.2 Utilize passive flooding and wave runup model projections in building and zoning ordinances (e.g., "Constraint District"): The state should support counties in updating zoning ordinances and building codes to incorporate model projections of passive flooding and wave runup.

Updated 2017 Recommendation 4: Enable ~~legacy~~ beaches to persist with sea level rise;

- Updated 2017 Recommended Action 4.1: Conduct a state-wide assessment of beaches applying the objectives of the Hawai`i Coastal Zone Management Act (HRS §205A-2). The DLNR, Office of Conservation and Coastal Lands (OCCL), together with federal, state, and county governments, nongovernmental organizations, and local stakeholders, should undertake a state-wide assessment to identify beaches and dune systems that are important for recreational uses, cultural practices, wildlife habitat, and coastal resilience. The state should further coordinate with county agencies to prohibit development in such areas, and even consider removing development from areas with upland sand deposits if we hope to retain this vital natural and cultural resource for future generations.
- Updated 2017 Recommended Action 4.2: Establish a "willing seller" program to move development away from beaches: The State should establish a "willing seller" program that pre-identifies property owners that would be willing to sell or relocate their property outside of the

state-wide vulnerability zone. There are many successful examples of "willing seller" programs, the most notable of which is the City of Portland, Oregon's "Johnson Creek Willing Seller Program" which helps move people and property out of areas that frequently flood. Restoration projects on land acquired through the program increase flood storage, improve fish and wildlife habitat, restore wetlands, and create passive recreational activities for city residents. For more information regarding this program, please visit https://www.portlandoregon.gov/bes/article/106234.

- Updated 2017 Recommended Action 4.3: Explore legislative and policy mechanisms to designate funding for priority coastal lands and enable the use of a variety of practices and tools and utilize existing programs to acquire beaches and other coastal lands for recreational, cultural, ecosystem and resilience objectives: The state and counties should consider additional legislative actions to identify a dedicated sources of funding for coastal land acquisition. The state should further pursue opportunities to leverage programs such as the Federal Coastal and Estuarine Land Conservation Program, as detailed in the Hawai`i Coastal and Estuarine Land Conservation Plan, and other federal or state land acquisition grant programs as they become available to acquire coastal property for conservation purposes. In addition to land acquisition for beaches, a variety of tools, including buffer zones and conservation easements, are needed to support conservation of coastal lands through incremental changes in the shoreline. Buffer zones could be used to restrict development within specified distances of natural and cultural resources. Expanding buffer zones around beaches, sand dunes, and coastal wetlands would provide space for these environments to migrate landward with rising sea levels. State law authorizes public bodies and nonprofit organizations to hold conservation easements for the purposes of preserving and protecting open space, natural landscapes, cultural and historical sites and resources, and agricultural lands.
- 2022 Recommended Action 4.4: Support County Parks Departments in the management of county beach parks. The State should coordinate closely with the County Parks Departments to ensure that beach parks are managed holistically and with natural resource protection as a key priority. Beach Parks present the best opportunity for the preservation of public access and conservation of natural shorelines and beach habitat.

2017 Recommendation 6: Protect nearshore water quality from sea level rise impacts

- 2022 Recommended Action 6.1.1: Support research and development efforts to identify and implement affordable alternatives to cesspools in shoreline areas: Following on the outcomes of the cesspool conversion working group, the state should sponsor research and development efforts to expand affordable and actionable conversion options for shoreline property owners. Such options should account for SLR-XA projections of coastal erosion and associated land loss, and potential failure of onsite sewage treatment systems resulting from SLR-induced groundwater inundation. Removal of cesspools is imperative to the health of nearshore waters for all properties within the SLR-XA and for members of the public accessing coastal resources. Removal may not be achievable by 2050 as directed by state law without viable alternatives for replacement.

- 2022 Recommended Action 6.4: Develop clear policy and guidance for onsite sewage disposal systems in the sea level rise exposure area to protect public health: The state should expand policy directives beyond the existing income tax credits and requirement for removal by 2050. Specifically, policy must address existing cesspools in the coastal zone in relation to

enforcement of existing laws and regulations and removal of unpermitted shoreline hardening. Cesspools on the shoreline and in the coastal zone will be an increasing source of nonpoint-source pollution as groundwater rises and coastal erosion accelerates. Applicable to Recommendation 6.1.

Recommendation 7: Develop innovative and sustainable financing and incentives to support adaptation to sea level rise

- 2022 Recommended Action 7.6: Explore the use of the FEMA funding for use in Hawai`i**:** The state should explore FEMA funding options to support moving homeowners away from flood zones in support of a comprehensive managed retreat plan. Specifically work with FEMA for Building Resilient Infrastructure and Communities (BRIC) grants, hazard mitigation programs and other funding opportunities to identify options for federal support to Hawaii's adaptation priorities. Additionally, the state should work with federal representatives to explore exemptions from prohibitive FEMA policies, particularly on DHHL Land where the lessee model may prohibit individuals from participating in the National Flood Insurance Program (NFIP).

2017 Recommendation 9: Promote collaboration and accountability for adapting to sea level rise

- 2022 Recommended Action 9.5: Incorporate community-scale vulnerability assessments and adaptation planning into the 2027 Sea Level Rise Vulnerability and Adaptation Report. The state should develop detailed and comprehensive community-based climate change and sea level rise vulnerability assessments and adaptation strategies that prioritize areas experiencing the most immediate and severe impacts with early and continuous community engagement and input.
- 2022 Recommended Action 9.6: Improve cooperation between state and county government agencies to strengthen enforcement and compliance with existing coastal laws The state should encourage and support its agencies to cooperate across jurisdictional frameworks and with the counties' various agencies to manage coastal resources. The state should encourage progessive action by its agencies to enforce coastal conservation laws and public and private compliance with coastal conservation laws. For county agencies that have conducted vulnerability assessments for their sectors, the state should review the assessments for consistency and consolidate them to comprehensively visualize and track vulnerabilities across the state.
- 2022 Recommended Action 9.7: Increase state agency capacity to enforce existing laws and regulations. The state should prioritize enforcement and compliance for natural resource protection by increasing staffing in regulatory, legal and enforcement agencies.

Next Steps

As an immediate next step, the State Climate Commission should adopt this report and forward it to the Legislature.

In addition to the recommendations listed above, the process of preparing this report has identified the following unmet needs and areas in need of focus in the next five years.

- **Facilitate interagency coordination for holistic adaptation planning** (e.g., comprehensive consideration and planning for natural resources, roads, communities; and improved communications between government agencies) (2017 Recommendation 9, 2022 Recommendation 1)
- **Conserve and adapt Native Hawaiian cultural resources and sites** (2017 Recommendation 5)
- **Integrate equity and justice considerations to vulnerability assessments and adaptation planning and actions** (2017 Recommendation 2)
- **Address and stop the loss of shoreline access** (2017 Recommendation 4)
- **Integrate economic valuation and ecosystem co benefits of natural coastal resources into planning and actions** (2017 Recommendations 4, 5 and 8)
- **Make managed retreat a viable option and identify funding mechanisms for adaptation** (2017 Recommendations 2 and 7)
- **Implement phased adaptation to sea level rise** (2017 Recommendation 1, 2, 7)

The Climate Commission should set these unmet needs as priority action areas from 2023-2027. To facilitate coordination among state agencies, the Commission should host a staff-level workshop or series of workshops for discussion of this report and the actions for each agency going forward. Such a workshop will set the agenda for the next five years, create a mechanism to ensure ongoing interagency collaboration, and provide a baseline for action.

Next Steps for the SLR Viewer

To increase our ability to plan for sea level rise The Climate Resilience Collaborative at the University of Hawai`i is working to update and expand the State of Hawai`i Sea Level Rise Viewer. Utilizing federal funding, researchers are developing the next generation of passive flooding, high wave flooding, coastal erosion, compound events and other relevant sea level rise exposure map data that will be available in three to five years. Specific elements of the work towards as Sea Level Rise Viewer 2.0 are as follow:

- Augment existing imagery database and increase spatial and temporal resolution of coastline observations by incorporating imagery from satellites and small unmanned aerial systems (sUAS or drones). This will allow for enhanced detail in analyses and modeling. Calculating historical rates of shoreline change with increased precision will improve future predictions of shoreline locations.
- The USGS-developed Coastal Storm Modeling System - Coastal On-line Assimilated Simulation Tool (CoSMos-COASTS) is being adapted to Hawai`i-specific wave conditions, and future sea level rise projections to emulate how the ocean behaves in the near shore environment in two directions – along-shore and cross-shore to expand on the existing SLR-XA modeling.
    - Development of a full transect grid along the islands' coastlines, including digitizing the shoreline and identifying non-erodible areas, as well as correctly classifying beach types and littoral cell boundaries for the CoSMos-COASTS model. This team is also working to set up the framework for collecting LandSat, Sentinel, and Planet Labs satellite imagery through the CoastSat package, written by Kilian Vos (UNSW).
    - Collecting aerial imagery and modeling the Island of O'ahu in phases. Orthomosaics have been generated for some areas in the islands, the shoreline positions have been

digitized and beach width determined, and historical and future shoreline change rates and hazard zones have been produced. Finally, aerial surveys are being conducted of all the shorelines.

The current SLR viewer has given the state of Hawai`i an opportunity to look ahead and understand the risks of sea level rise well into the future. In a collaborative effort, this new research will help to provide improved estimates of future shoreline positions for all beaches in Hawai`i with increased spatial and temporal accuracy. Ultimately, these predicted shoreline positions will continue to inform policy decisions for shoreline management, and community resilience for the State. With this knowledge, as the state adapts to higher sea levels, priority should be given to adaptation tools that protect, and enhance the public coastal resources and access. It is critical that developments, and redevelopments be sited and designed to not require future protection that may alter a natural shoreline.

Conclusion

As sea level rise continues to accelerate, the State of Hawai`i must maintain a constant and ongoing effort to adopt policies and programs to support adaptation to a changing world. Although there has been progress made towards reducing vulnerability and enhancing adaptability, we must maintain a diligent focus on continual and ongoing improvement of community engagement, laws, regulations, and policies to meet the challenge ahead and safeguarding our cultural and natural resources while also providing adaptation tools to the people of Hawai`i in an equitable manner. The recommendations contained in the 2017 Report and this update provide key steps towards increasing the islands' resiliency to sea level rise and many of the recommended actions provide co-benefits such as mitigating impacts from storms and tsunami and improving overall community vitality. In the next five years, the state must continue to work towards identifying and implementing programs which sustain vibrant communities while improving resilience to sea level rise and mitigating other natural hazards.

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Appendix A

Responses to Learning Questions from the 2017 Hawai`i Sea Level Rise Vulnerability and Adaptation Report

Sea Level Rise Outlook: Global and Local Observations and Projections

1. What are the observations of change in sea level in the vicinity of the Hawaiian Islands, and how do they correspond with the recent global acceleration in mean sea level rise?

Long-term observational data from local tide gauge stations show that sea level is rising around Hawai'i. Models indicate that Hawai'i and other tropical Pacific sites will experience sea level rise that is 16% to 20% higher than the global average (Sweet. et al. 2022). The NOAA 2022 report provides a range of regionalized sea level rise scenarios based on differing GHG emissions pathways and associated global warming and ice sheet melt. The report finds that sea level will rise around Hawaii between 0.7 and 1.5 feet by 2050. The Intermediate (mid-range) estimate is for a rise of 1.0 feet (relative to sea level in the year 2000). The observed rate of sea level rise measured from tide gauges in Hawaii lead to a median estimate of 0.8 feet by 2050, though this rate is expected to accelerate in coming decades similar to global trends. Sea level will rise between 1.3 and 8.0 feet by 2100 (relative to the year 2000) with an Intermediate estimate of 3.9 feet (Sweet, et al. 2022).

2. To what extent has the magnitude and timing of the sea level rise projections from IPCC AR5 changed with new projections from the IPCC AR6?

Sea level rise exposure mapping in the 2017 Hawai'i Sea Level Rise Report and Hawaii Sea Level Rise Viewer is based on an upper-end projection in the 2013 IPCC 5th Assessment Report of 3.2 feet of global mean sea level rise by 2100. As expected, the science on sea level rise observations and forecasts has continued to advance. Since completion of the 2017 Report, peer-reviewed scientific literature as well as government and multinational reports increasingly point to 3 to 4 feet of sea level rise by 2100 as a mid-range, rather than high-end, scenario for Hawai'i.

3. What are the observations and projections of the frequency and intensity of tropical cyclones and El Niño events and their effects on coastal water levels and tidal flooding?

Major tropical cyclones (hurricanes) in Hawaii's region of the Central North Pacific are much less common than in the Eastern and Western tropical Pacific. From 1991-2020, an average of 3.6 tropical storms, 1.7 hurricanes (Category 1 or above), and 0.9 major hurricanes (Category 3 or above) occurred per year in the Central Pacific (J. Marra and H. Diamond, NOAA, personal communication, November 21-22, 2022). Of particular note in the past five years, Hurricane Walaka reached Category 5 status on October 1, 2018 passing south and west of the main Hawaiian Islands but traveled directly over Kānemiloha'i (French Frigate Shoals) in Papahānaumokuākea Marine National Monument as a Category 3 hurricane (https://www.nhc.noaa.gov/data/tcr/CP012018_Walaka.pdf). East Island, a low-lying sand and gravel atoll island in French Frigate Shoals and an important green sea turtle nesting site, was almost completely washed away by Walaka's waves and storm surge. Elevated sea surface temperatures in the Central North Pacific (1.0º to 1.5º Celsius above average) and low wind shear contributed to Walaka's unusual strength (H. Diamond, NOAA, personal communication, November 21, 2022). While it

is difficult to blame climate change on a single storm event, Walaka may serve as an example of increasing tropical cyclone activity and impacts for Hawaii likely to occur in coming decades.

Advancing research since the 2017 SLR Report using climate models points to similar frequency but increasing intensity of tropical cyclones around Hawaii, linked primarily to increased warming of ocean surface waters (Widlansky, et al. 2019). El Nino conditions generally mean increased occurrence of tropical storms around Hawaii. The "triple dip" La Nina conditions over the past three years has likely suppressed tropical cyclone activity around Hawaii over that time period due to cooler waters and increased windshear (changes in wind speed and direction with altitude). Record high sea levels in 2017 have been linked to delayed effects from a strong El Nino in 2015 and climate model projections point to increased periods of weak trade winds following El Nino events that have been linked to the occurrence of high sea levels around Hawaii (Long, et al. 2020).

Methodology

1. **To what extent do new global sea level rise projections differ from those used in this hazard modeling?**

Sea level rise exposure mapping in the 2017 Hawai'i Sea Level Rise Report and Hawaii Sea Level Rise Viewer is based on an upper-end projection in the 2013 IPCC 5th Assessment Report of 3.2 feet of global mean sea level rise by 2100. As expected, the science on sea level rise observations and forecasts has continued to advance. Since completion of the 2017 Report, peer-reviewed scientific literature as well as government and multinational reports increasingly point to 3 to 4 feet of sea level rise by 2100 as a mid-range, rather than high-end, scenario for Hawai'i.

2. To what extent have data and coastal hazard modeling improved to warrant updating this hazard modeling?

As current science, observations and projections evolve, the University of Hawai`i Climate Resilience Collaborative is working to update and expand the State of Hawaii Sea Level Rise Viewer. Utilizing federal funding, researchers are developing the next generation of passive flooding, high wave flooding, coastal erosion, compound events and other relevant sea level rise exposure map data that will be available in three to five years.

3. To what extent have property values, population, and other development trajectories changed from the baseline data used in this report?

<u>Property Values</u>
The 2017 Report estimated that the value of private lands and structures within the SLR-XA on O'ahu was roughly $12.9 billion. A precise answer to this question was not attainable for the purposes of this report. Calculations of the change in property value are in progress by the University of Hawai'i Institute for Sustainability and Resilience (ISR), led by Dr. Makena Coffman (personal communications, 2022).

<u>Population</u>
The 2017 Report states that "[o]ver the next 30 to 70 years, chronic flooding with sea level rise will increase, impacting homes and businesses located near the shoreline. Approximately…19,800 people statewide would be exposed to chronic flooding in the SLR-XA with 3.2 feet of sea level rise." A precise answer to this question was not attainable for the purposes of this report. Updated population calculations are in progress by the ISR.

Development

The 2017 Report states that "[o]ver the next 30 to 70 years, chronic flooding with sea level rise will increase, impacting homes and businesses located near the shoreline. Approximately 6,500 structures…statewide would be exposed to chronic flooding in the SLR-XA with 3.2 feet of sea level rise."

Development trends throughout the state have not significantly changed since 2017, however the recent and pending updates to county SMA and shoreline setback ordinances may affect coastal development patterns moving forward.

4. Is the SLR-XA for 3.2 feet of sea level rise modeled in the Report still valid as the exposure overlay for the mid to latter half of this century?

The latest science suggests that the SLR-XA for 3.2ft of sea level remains valid as a planning overlay for the mid century at this time. Following the latest Sweet, et al., 2022 NOAA-interagency sea level rise report, the State should update the guidance to set a planning and policy benchmark of 4 ft for all planning and design for actions and infrastructure planned to 2100, and apply a 6 ft benchmark for planning and design of public infrastructure projects and other projects with low tolerance for risk.

Results

1. To what extent is potential chronic flooding in the SLR-XA with 1.1 foot of sea level rise aligned with areas currently exposed to chronic flooding?

In 2017, and again in 2020, the Honolulu Harbor Tide gauge recorded the highest daily mean water levels observed over its 112-year history. These record high water levels were produced by a combination of phenomena that included long-term global sea level rise, peak annual astronomical tides ("king tides"), wave setup, and migration of warm buoyant waters brought in by winds and currents. During both events, observed sea levels tracked between 0.5 and 1 ft higher than predicted, providing a glimpse of what will become a more common occurrence in the near future as sea level continues to rise. Flooding observed during these events was widely documented as part of the Hawai`i and Pacific Islands King Tides citizen science program. Local impacts were observed throughout the State in the form of increased coastal erosion, minor wave over-wash flooding, backshore flooding from groundwater rise and storm drain backflow, and impeded and potentially hazardous beach access. Observations in low-lying areas like Mapunapua on Oahu confirmed flooding characterized by SLR-XA passive flood layers representing the 1.1 ft scenario.

2. Are there any new developments or critical infrastructure in the SLR-XA with 3.2 feet of sea level rise not accounted for in the vulnerability assessment?

State and County updated policies are designed to reduce the building of new homes and infrastructure within the SLR-XA. In preparing this report, a full assessment of new development or critical infrastructure within the 3.2ft SLR-XA was not conducted. This report recommends a full vulnerability assessment for the 2027 Report.

3. To what extent have land and structure values for parcels in areas potentially impacted by sea level rise changed as a basis for estimating potential economic loss?

It is not clear that there has been any trend in shoreline development or retreat that would meaningfully change the basis for estimating economic loss in the SLR-XA since the 2017 Report.

4. To what extent has human migration from other Pacific Islands and wildlife migration from the NWHI to the main Hawaiian Islands changed?

It is unknown at this time whether there has been a change in human and wildlife migration patterns since the 2017 report.

5. What adaptation measures have been taken to reduce vulnerability to sea level rise?

Several adaptation measures have been taken throughout the state which reduce vulnerability to sea level rise. Most of these are detailed in the Recommendations section of the report, and are highlighted here briefly as specific measures which may reduce individual vulnerability to sea level rise.

The following is a general listing of actions which are further detailed in the Recommendations section in the body of this report:

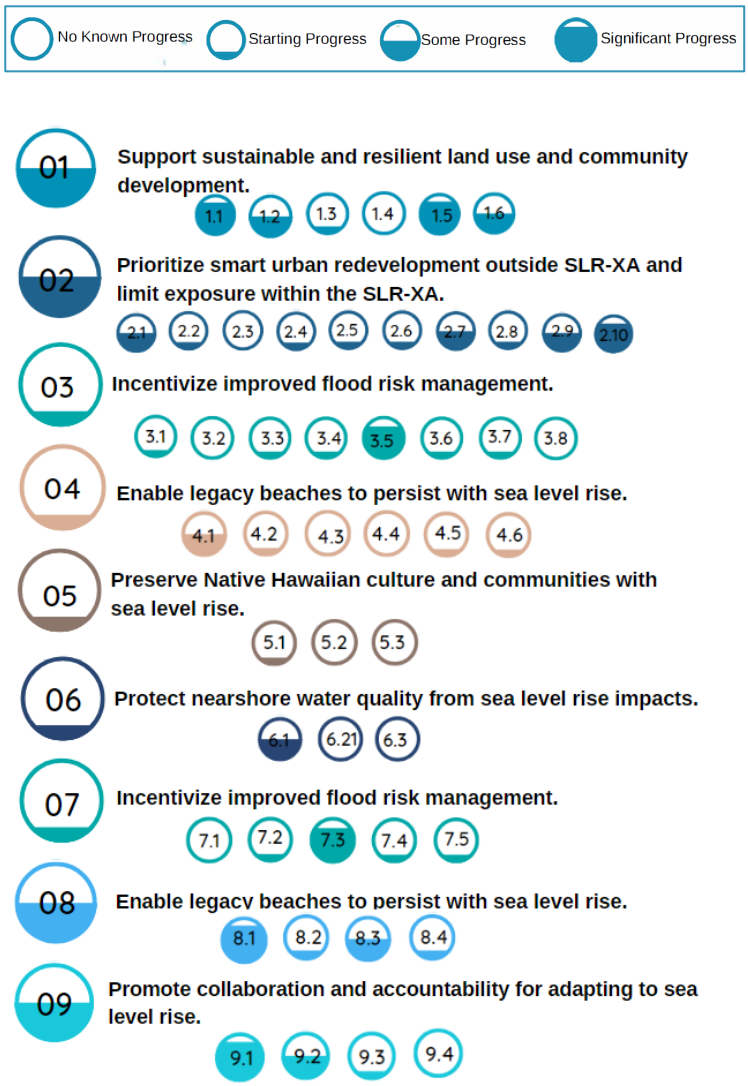
- County of Kaua'i passed first of its kind Sea Level Rise Constraint District that uses passive flooding and wave runup models developed for Hawai'i Sea Level Rise Viewer. The constraint district is a great example of resilient design standards for proposed uses within the SLR-XA.
- The state implemented a disclosure requirement for real estate transactions for all properties located within the sea level rise exposure area.
- The state has sponsored or permitted beach nourishment activities in Waikiki and elsewhere which improve resiliency by augmenting the beach profile and replacing eroded sand onto the beach. Coupled with sand nourishment, some projects have also included groin construction in an effort to keep nourished sand on the beach.
- In 2020, County of Kaua`i established a Special Treatment Coastal Edge District (ST-CE) as areas that are highly vulnerable to coastal hazards including but not limited to sea level rise, coastal erosion, high wave run-up, passive flooding, and an increased frequency and intensity of storms. Within the ST-CE any use, structure, or development permitted with or without a Use Permit in the Special Treatment Coastal Edge District shall mitigate impacts from coastal hazards, including but not limited to sea level rise, coastal erosion, high wave run-up, passive flooding, and an increased frequency and intensity of storms.
- Along the elevated portions of the Honolulu Rail Transit Project between Chinatown and Ala Moana Center the stations were redesigned so no electronics below 6ft and elevated portions meet federal requirements even if roads are raised by 6ft. Additionally, all hanging elements were removed to allow for 6ft of adaptation.
- Sidewalks and entryways in Kaka`ako are elevated above street level to account for flooding.
- The City and County of Honolulu and the Maui County both issued Mayoral Declarations requiring executive departments to consider and incorporate SLR-XA data for capital planning.
- City and County of Honolulu Department of Planning and Permitting instituted a requirement for consideration of sea level rise for all building permits and for all properties conducting renovations within the SLR-XA.

Recommendations

1. What recommendations have been implemented and why?

The status of the recommendations and recommended actions contained in the 2017 Report is covered in detail in the body of this report. Progress towards meeting the nine recommendations (represented

by large circles) and 49 associated recommended actions (represented by small circles) is presented here as measured on a qualitative scale of “no known progress” to “significant progress”.



Some key statewide accomplishments that address the recommendations are noted as follows:

Use of the Sea Level Rise Exposure Area Data and Sea Level Rise Viewer: Although the Sea Level Rise Exposure Area (SLR-XA) was not officially recognized as a state-wide vulnerability zone, the Viewer and SLR-XA are in widespread use by state and county agencies for adaptation planning purposes. The use of the SLR-XA data as identified by the Viewer for policy decisions was enabled by the peer reviewed publication of the methods, which allowed for the removal of the original disclaimer language cautioning against such use. Easy availability and the establishment of guidance for SLR-XA data interpretation via the viewer made it critically important to the success of planning efforts and new policies. We recommend a continual peer review of ongoing research to strengthen the research products used in policy decision making.

**Hawai`i Coastal Zone Management Act Updates**: Act 16, SLH2020 updated the Hawai`i Coastal Zone Management Act (HRS Chapter 205A) in many ways including strengthening protections for beach and

other coastal environments by specifically prohibiting private shoreline hardening structures and minimizing public shoreline hardening structures, including seawalls and revetments, at sandy beaches where they would interfere with existing recreational and waterline activities.

Sea Level Rise Report Addendum: Guidance for Using the Sea Level Rise Exposure Area in Local Planning and Permitting Decisions was published by the State as a supplement to the 2017 Report. The Addendum was prepared by the University of Hawai`i Sea Grant College Program with the Hawai`i Department of Land and Natural Resources - Office of Conservation and Coastal Lands for the Hawai`i Climate Change Mitigation and Adaptation Commission - Climate Ready Hawai`i Initiative. The Hawai`i Climate Change Mitigation and Adaptation Commission issued a statement of approval for the Addendum at its October 28 2020 meeting.

Hawai`i 2018 Hazard Mitigation Plan: The 2018 update of the State's Hazard Mitigation Plan includes expanded consideration of climate change and sea level rise hazards, including hazard assessment using the SLR-XA and a 1% Annual-Chance Coastal Flood Zone with 3.2 feet of sea level rise (1%CFZ-3.2) modeled for the Plan: https://dod.hawaii.gov/hiema/sert-resources/hazard-mitigation/

Planning for Managed Retreat: OPSD-CZM published a report titled *Assessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawai`i* in 2019 and is embarking on a next-step study that will assess the options for and implications of implementing managed retreat from the perspectives of (1) policy and regulation, and (2) funding and financing mechanisms in 2023.

Statewide Inventory of Vulnerable Infrastructure: Act 178 Relating to Sea Level Rise Adaptation was passed to begin the long-term planning needed to effectively address climate impacts. OPSD-CZM submitted a report to the legislature in 2021 reporting on progress towards the phased approach required by Act 178.

In addition to the above listed state-wide highlights, the ongoing support from University of Hawai`i entities such as the Sea Grant College Program, the Climate Resilience Collaborative, and others) to state and county agencies provided expertise for interpretation of the report and practical implementation of recommendations and use of data. The capacity to address the impacts of sea-level rise grew at county and state levels of government. For example, the City and County of Honolulu established the City and County of Honolulu established the Climate Change Commission. The City and County of Honolulu and the County of Maui established an Office of Climate Change, Sustainability and Resiliency; the County of Hawaii maintains a Climate Change Action program within its Office of Research and Development and the County of Kauai maintains a Sustainability Program Area within its Office of Economic Development.

2. What recommendations have not been implemented and why?

Although the state made progress towards implementing the recommendation of the 2017 Report, there are areas of unmet need that require a renewed focus over the next five years.

- **Facilitate interagency coordination for holistic adaptation planning** (e.g., comprehensive consideration and planning for natural resources, roads, communities; and improved communications between government agencies) (2017 Recommendation 9, 2022 Recommendation 1)
- **Conserve and adapt Native Hawaiian cultural resources and sites** (2017 Recommendation 5)

- **Integrate equity and justice considerations to vulnerability assessments and adaptation planning and actions** (2017 Recommendation 2)
- **Address and stop the loss of shoreline access** (2017 Recommendation 4)
- **Integrate economic valuation and ecosystem co benefits of natural coastal resources into planning and actions** (2017 Recommendations 4, 5 and 8)
- **Make managed retreat a viable option and identify funding mechanisms for adaptation** (2017 Recommendations 2 and 7)
- **Implement phased adaptation to sea level rise** (2017 Recommendation 1, 2, 7)

The status of the recommendations and recommended actions contained in the 2017 Report is covered in detail in the body of this report.

The summary graphic in the answer to question 2 in this section captures recommendations and recommended actions for which no action and/or little progress was reported.

The 2017 Recommendations were adopted by the State Climate Commission but were not specifically assigned to individual agencies for action. As a result, individual agencies prioritize and implement new programs or policies aligned with their strategic goals, and not in response to all recommendations from the 2017 Report. Overall funding and personnel capacity also hinder progress towards implementing the recommendations and recommended actions.

3. What have been barriers to implementation and measures taken to overcome these barriers?

The COVID pandemic caused delays to action across the federal, state and county government agencies. Although capacity to address climate change and sea level rise increased at the state and county levels, there is a need for additional personnel and funding as outlined in the updated recommendations in this report. Additionally, specific to the implementation of progressive shoreline setback ordinances, there is a need for public engagement and education regarding the need and benefit for increased setback distances. Opposition from property rights advocates will continue to be an issue when attempting to implement stricter setback rules.

There is also a lack of funding mechanisms to enable managed retreat. The ongoing work of OPSD-CZM to study the various possibilities should be supported and the findings of the initial study should be implemented.

4. To what extent has Hawaii's capacity to adapt to sea level rise increased based on benchmarks and measurable indicators?

Among the updated recommendations presented in this interim report is a focus on the facilitation of interagency coordination for holistic adaptation planning and greater resources dedicated to tracking and integrating agency initiatives and efforts towards adaptation. There are currently no benchmarks or measurable indicators to measure the State's progress towards sea level rise adaptation. In order to objectively assess Hawaii's capacity to adapt to sea level rise, we must set benchmarks for measurement and all state and county agencies must adopt and utilize those benchmarks.

This Report did not undertake an effort to assess reductions in vulnerability or increased capacity to adapt to sea level rise based on the implementation of the recommended actions. We recommend that the state should conduct a full review of all actions taken in response to the 2017 and 2022 recommendations to determine the reduction in vulnerability for areas within the exposure area. as part of the 10-Year Update.

Global and Regional Sea Level Rise Scenarios for the United States

Credit ©Gary L Kohn

US Army Corps of Engineers

USGS science for a changing world

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FIU Institute of Environment
Florida International University

ATTACHMENT D

Cover Image: Flooding from 15-knot northerly winds on Smith Island, Maryland, on November 23, 2015. Credit ©Gary J. Kohn

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Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines

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Table of Contents

List of Figures

List of Tables

Executive Summary

This report and accompanying datasets from the U.S. Sea Level Rise and Coastal Flood Hazard Scenarios and Tools Interagency Task Force provide 1) sea level rise scenarios to 2150 by decade that include estimates of vertical land motion and 2) a set of extreme water level probabilities for various heights along the U.S. coastline. These data are available at 1-degree grids along the U.S. coastline and downscaled specifically at NOAA tide-gauge locations. Estimates of flood exposure are assessed using contemporary U.S. coastal flood-severity thresholds for current conditions (e.g., sea levels and infrastructure footprint) and for the next 30 years (out to year 2050), assuming no additional risk reduction measures are enacted.

This effort builds upon the 2017 Task Force report (Sweet et al., 2017). In particular, the set of global mean sea level rise scenarios from that report are updated and downscaled with output directly from the United Nations Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6; IPCC, 2021a), through the efforts of the NASA Sea Level Change Team; updates include adjustments to the temporal trajectories and exceedance probabilities of these scenarios based upon end-of-century global temperatures. As with the 2017 report, these global mean sea level rise scenarios are regionalized for the U.S. coastline. In addition, methodology supporting the U.S. Department of Defense Regional Sea Level (DRSL) database[1] (Hall et al., 2016) is adapted for the extreme water level dataset newly developed for this report.

This report will be a key technical input for the Fifth National Climate Assessment (NCA5). These data and information are being incorporated into current and planned agency tools and services, such as NOAA's Sea Level Rise Viewer and Inundation Dashboard,[2] NASA's Sea Level Change Portal,[3] and others. Although the intent of this report is not to provide authoritative guidance or design specifications for a specific project, it is intended to help inform Federal agencies, state and local governments, and stakeholders in coastal communities about current and future sea level rise to help contextualize its effects for decision-making purposes.

Key Message #1:
Multiple lines of evidence provide increased confidence, regardless of the emissions pathway, in a narrower range of projected global, national, and regional sea level rise at 2050 than previously reported (Sweet et al., 2017).

- Both trajectories assessed by extrapolating rates and accelerations estimated from historical tide gauge observations, and model projections, fall within the same range in all cases, giving higher confidence in these relative sea level (RSL; land and ocean height changes) rise amounts by 2050.
- Relative sea level along the contiguous U.S. (CONUS) coastline is expected to rise on average as much over the next 30 years (0.25–0.30 m over 2020–2050) as it has over the last 100 years (1920–2020).
- Due to processes driving regional changes in sea level, there are similar regional differences in both the modeled scenarios and observation-based extrapolations, with higher RSL rise along the East (0–5 cm higher on average than CONUS) and Gulf Coasts (10–15 cm higher) as compared to the West (10–15 cm lower) and Hawaiian/Caribbean (5–10 cm lower) Coasts.
- The projections do not include natural year-to-year sea level variability that occurs along U.S. coastlines in response to climatic modes such as the El Niño–Southern Oscillation.

[1] https://drsl.serdp-estcp.org/
[2] https://coast.noaa.gov/digitalcoast/tools/slr.html
[3] https://sealevel.nasa.gov/

Key Message #2

By 2050, the expected relative sea level (RSL) will cause tide and storm surge heights to increase and will lead to a shift in U.S. coastal flood regimes, with major and moderate high tide flood events occurring as frequently as moderate and minor high tide flood events occur today. Without additional risk-reduction measures, U.S. coastal infrastructure, communities, and ecosystems will face significant consequences.

- Minor/disruptive high tide flooding (HTF; about 0.55 m above mean higher high water [MHHW][4]) is projected to increase from a U.S average frequency of about 3 events/year in 2020 to >10 events/year[5] by 2050.
- Moderate/typically damaging HTF (about 0.85 m above MHHW) is projected to increase from a U.S. average frequency of 0.3 events/year in 2020 to about 4 events/year in 2050.
- Major/often destructive HTF (about 1.20 m above MHHW) is projected to increase from a U.S. average frequency of 0.04 events/year in 2020 to 0.2 events/year by 2050.
- Across all severities (minor, moderate, major), HTF along the U.S. East and Gulf Coasts will largely continue to occur at or above the national average frequency.

Key Message #3:

Higher global temperatures increase the chances of higher sea level by the end of the century and beyond. The scenario projections of relative sea level along the contiguous U.S. (CONUS) coastline are about 0.6–2.2 m in 2100 and 0.8–3.9 m in 2150 (relative to sea level in 2000); these ranges are driven by uncertainty in future emissions pathways and the response of the underlying physical processes.

- With an increase in average global temperature of 2°C above preindustrial levels, and not considering the potential contributions from ice-sheet processes with limited agreement (low confidence) among modeling approaches, the probability of exceeding 0.5 m rise globally (0.7 m along the CONUS coastline) by 2100 is about 50%. With 3°–5°C of warming under high emissions pathways, this probability rises to >80% to >99%. The probability of exceeding 1 m globally (1.2 m CONUS) by 2100 rises from <5% with 3°C warming to almost 25% with 5°C warming.
- Considering low-confidence ice-sheet processes and high emissions pathways with warming approaching 5°C, probabilities rise to about 50%, 20%, and 10% of exceeding 1.0 m, 1.5 m, or 2.0 m of global rise by 2100, respectively. These processes are unlikely to make significant contributions with 2°C of warming, but how much warming might be required to trigger them is currently unknown.
- As a result of improved understanding of the timing of possible large future contributions from ice-sheet loss, the "Extreme" scenario from the 2017 report (2.5 m global mean sea level rise by 2100) is now viewed as less plausible and has been removed. Nevertheless, the potential for increased acceleration in the late 21st century and beyond means that the other high-end scenarios provide pathways that could reach this threshold in the decades immediately following 2100 (and continue rising).
- Regionally, the projections are near or higher than the global average in 2100 and 2150 for almost all U.S. coastlines due to the effects from vertical land motion (VLM); gravitational, rotational, and deformational effects due to land ice loss; and ocean circulation changes. Largely due to VLM, RSL projections are lower than the global amounts along the southern Alaska coast and are higher along the Eastern and Western Gulf coastlines.

[4] Mean higher high water (MHHW) level is estimated over the 1983–2001 tidal epoch period and, in this case, is considered a fixed elevation that does not change with sea level rise.

[5] The extreme value statistical methods in this report do not directly resolve frequencies >10 events/year.

Key Message #4

Monitoring the sources of ongoing sea level rise and the processes driving changes in sea level is critical for assessing scenario divergence and tracking the trajectory of observed sea level rise, particularly during the time period when future emissions pathways lead to increased ranges in projected sea level rise.

- Efforts are under way to narrow the uncertainties in ice-sheet dynamics and future sea level rise amounts in response to increasing greenhouse gas forcing and associated global warming.
- Early indicators of changes in sea level rise trajectories can serve to trigger adaptive management plans and are identified through continuous monitoring and assessment of changes in sea level (on global and local scales) and of the key drivers of sea level change that most affect U.S. coastlines, such as ocean heat content, ice-mass loss from Greenland and Antarctica, vertical land motion, and Gulf Stream system changes.

Section 1: Introduction

Sea level rise driven by global climate change is a clear and present risk to the United States today and for the coming decades and centuries (USGCRP, 2018; Hall, Weaver et al., 2019). Sea levels will continue to rise due to the ocean's sustained response to the warming that has already occurred—even if climate change mitigation succeeds in limiting surface air temperatures in the coming decades (Fox-Kemper et al., 2021). Tens of millions of people in the United States already live in areas at risk of coastal flooding, with more moving to the coasts every year (NOAA NOS and U.S. Census Bureau, 2013). Rising sea levels and land subsidence are combining, and will continue to combine, with other coastal flood factors, such as storm surge, wave effects, rising coastal water tables, river flows, and rainfall (Figure 1.1), some of whose characteristics are also undergoing climate-related changes (USGCRP, 2017). The net result will be a dramatic increase in the exposure and vulnerability of this growing population, as well as the critical infrastructure related to transportation, water, energy, trade, military readiness, and coastal ecosystems and the supporting services they provide.

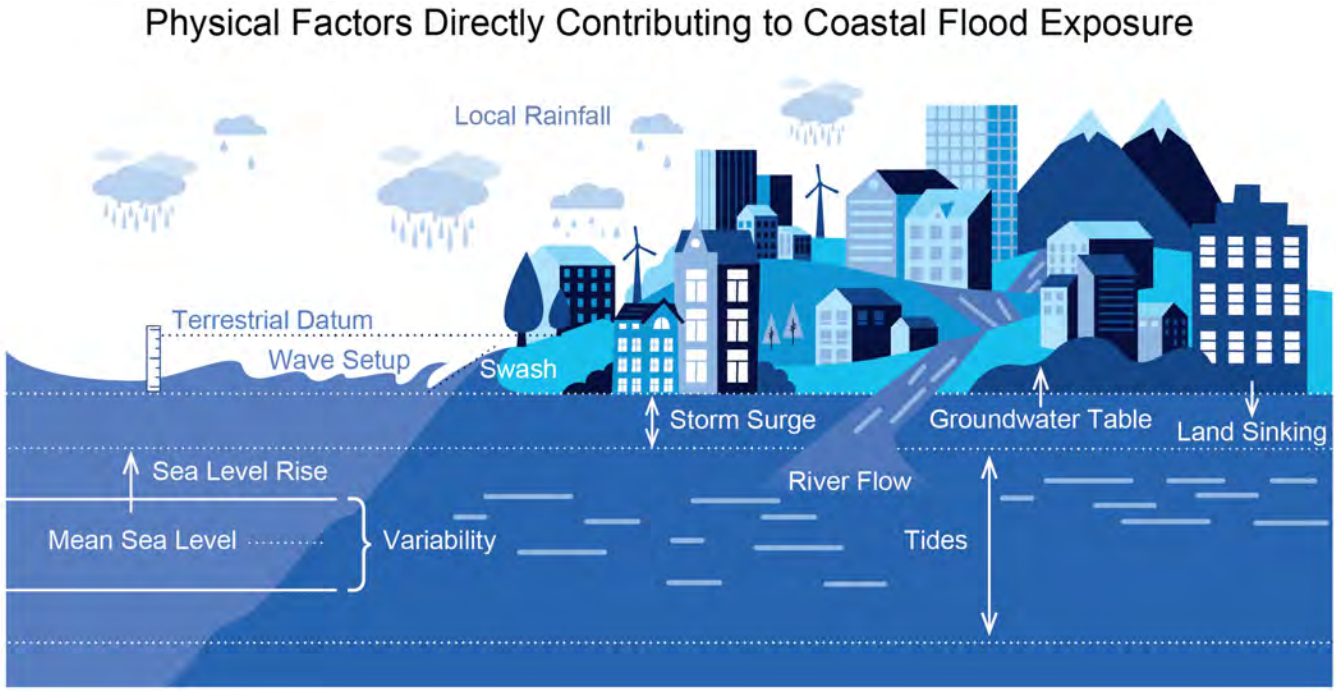

Figure 1.1: Schematic (not to scale) showing physical factors affecting coastal flood exposure. Due to the clear and strong relative sea level rise signal (i.e., combination of sea level rise and sinking lands), the probability of flooding and impacts are increasing along most U.S. coastlines.

Global mean sea level (GMSL) rise is a direct effect of climate change, resulting from a combination of thermal expansion of warming ocean waters and the addition of water mass into the ocean, largely associated with the loss of ice from glaciers and ice sheets. These processes are well understood for the recent past, and their contributions have been estimated for the 20th century (Figure 1.2a). With regard to increasing sea levels associated with climate change, the questions are when and how much, rather than if (USGCRP, 2017; Hall, Weaver et al., 2019). Increases in GMSL provide an important indicator of the changing climate, but it is the sea level rise on local and regional scales—measured by the global network of tide gauges and satellites—that is most relevant for coastal communities around the world. Regional and local sea level rise has not been and will not be uniform in time or space. Rather, sea levels change locally for a variety of reasons, such as vertical land motion (VLM), which can exacerbate the effects of the rising ocean. For context, whereas GMSL has risen by about 17 cm over the last 100 years (1920–2020), with noted acceleration since about 1970, relative sea level (RSL) averaged along the contiguous United States (CONUS) has risen about 28 cm over the same period with similar onset of acceleration (Figure 1.2b).

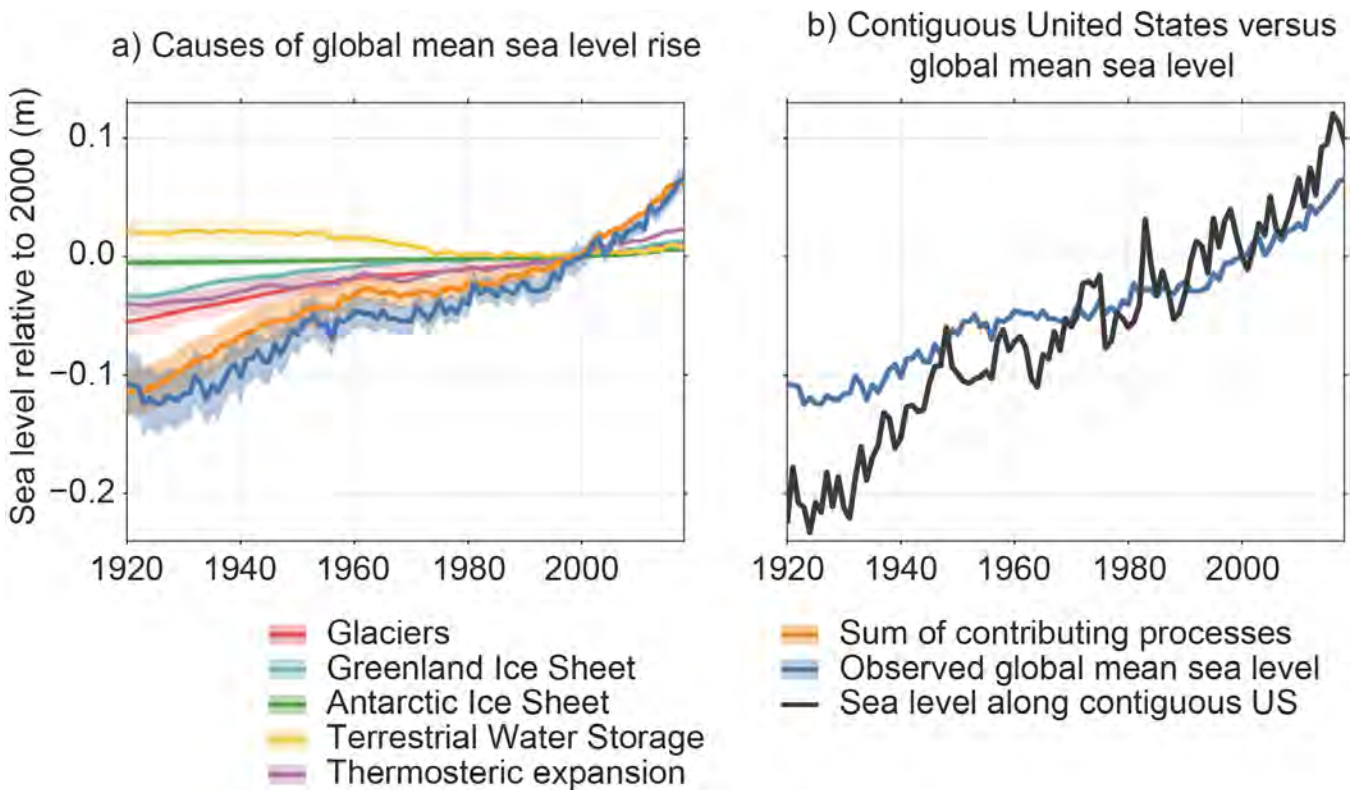

Figure 1.2: a) Observed annual global mean sea level (GMSL) change from global tide gauges (blue line), along with the sum (orange line) of contributions from thermal expansion (thermosteric) and four distinct water-mass-driven increases in GMSL. b) GMSL change (blue line) as shown in a) with the annual average relative sea level change measured by tide gauges around the contiguous United States (black line; with a linear regression estimate of 28 cm of sea level rise from 1920 to 2020). (Adaptation of Frederikse et al., 2020).

While this long-term and upward shift in mean RSL is the underlying driver of changes to the Nation's coasts, extreme water levels (EWLs) occurring against the background of this shifting sea level baseline are responsible for many of the recurring and event-based impacts. In this report, EWLs are explicitly assumed to be ocean-related changes measured by tide gauges (e.g., high tides and storm surges), which typically do not measure other contributors such as direct rainfall or river flow unless they are positioned upstream of major river systems (Moftakhari et al., 2016). Specifically, EWLs are considered as those occurring with an average event frequency between 0.01 events/year (often referred to as the 1% annual chance event) and 10 events/year. This range mostly spans the flood frequency of NOAA high tide flood (HTF) severity levels (minor, moderate, and major). HTF levels are nationally calibrated against NOAA's National Weather Service and local emergency managers' depth-severity thresholds used in weather forecasting and impact communications (NOAA, 2020) to provide a consistent coastal-climate resilience standard (Sweet et al., 2018).

Higher sea levels amplify the impacts of storm surge, high tides, coastal erosion, and wetland loss, even absent any changes in storm frequency and intensity. Because of threshold effects related to changes measured relative to a fixed elevation (Figure 1.3a), even the relatively small increases in sea level over the last several decades have led to greatly increased frequency of flooding[6] at many places along the U.S. coast (Figure 1.3b). Much of the coastline is already close to a flood regime shift, with respect to flood frequency (and presumably damages). That is, only about a 0.3–0.7 m height difference currently separates infrequent, moderate/typically-damaging and major/often-destructive HTF from minor/disruptive "nuisance" HTF (Sweet et al., 2018), whose impacts are already remarkable throughout dozens of densely populated coastal cities (Moore and Obradovich, 2020). Decades ago, powerful storms were what typically caused coastal flooding,

[6] The definition of a "flood" in this report is typically meant to refer to a water level associated with impacts rather than the occurrence of natural phenomena.

but today, due to RSL rise, even common wind events and seasonal high tides regularly cause HTF within coastal communities, affecting homes and businesses, overloading stormwater and wastewater systems, infiltrating coastal groundwater aquifers with saltwater, and stressing coastal wetlands and estuarine ecosystems.

At multiple locations along the U.S. coastline, the annual frequency of minor HTF is accelerating and has more than doubled over the past couple of decades, turning it from a rare event into a recurrent and disruptive problem (Sweet and Park, 2014; Sweet et al., 2018; USGCRP, 2018). For example, the trends in minor/disruptive HTF have grown from about 5 days in 2000 to 10–15 days in New York City and Norfolk, Virginia, in 2020; in Miami, Florida, and Charleston, South Carolina, annual frequencies have grown from 0–2 days to about 5–10 days over the same period. These increases will continue, further accelerate, and spread to more locations over the next couple of decades (Sweet et al., 2021; Thompson et al., 2021). Thus, accurate projections of ongoing and future sea level rise and assessments that integrate across processes and temporal and spatial scales are key inputs to planning efforts and a key goal of this report.

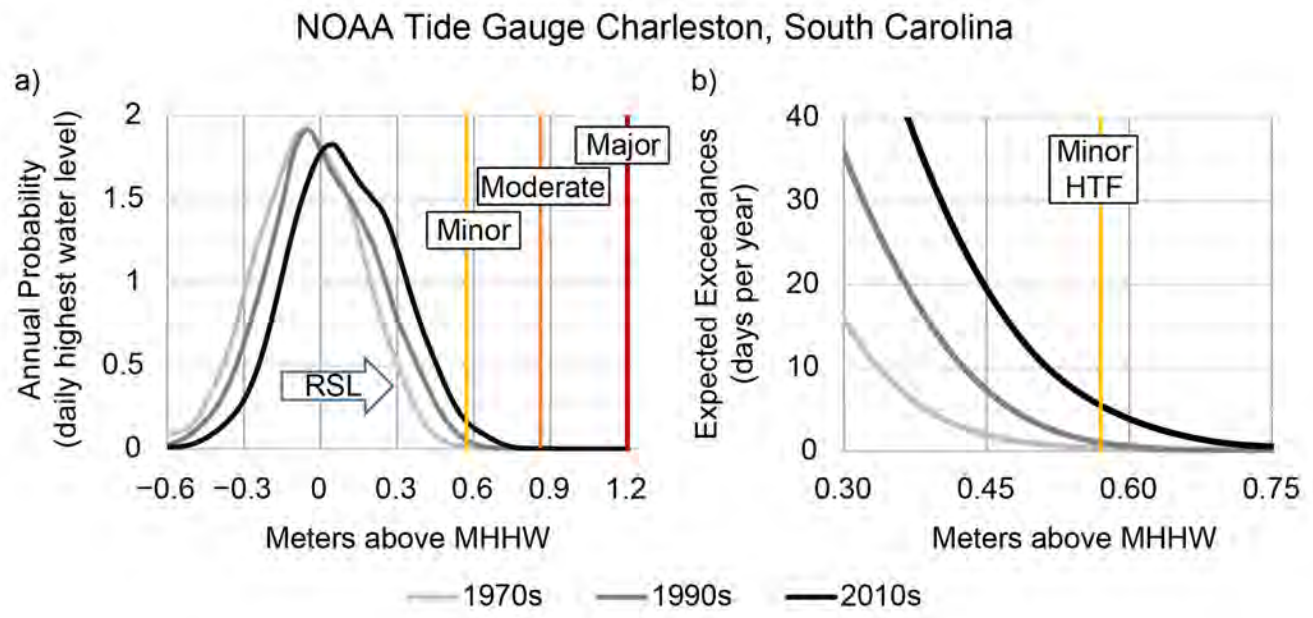

Figure 1.3: a) Annual probability density and b) annual expected exceedances for daily highest water levels relative to the 1983–2001 mean higher high water (MHHW) tidal datum showing increases in NOAA minor, moderate, and major high tide flooding (HTF) probabilities/frequencies due to relative sea level (RSL) rise at the NOAA tide gauge in Charleston, South Carolina.

The Sea Level Rise and Coastal Flood Hazard Scenarios and Tools Interagency Task Force (hereafter "Task Force") was jointly convened at the direction of the White House Resilience Council in 2015 under the U.S. Global Change Research Program (USGCRP), the Subcommittee on Ocean Sciences and Technology (SOST), and the National Ocean Council (NOC). This was in recognition of the strong need and demand for authoritative, consistent, and accessible sea level rise and associated coastal hazard information for the entire U.S. coastline, coordinated across the relevant Federal agencies, to serve as a starting point for on-the-ground coastal preparedness planning and risk management activities. The goal of the Task Force, since its inception, has been to develop the necessary products through sustained and coordinated participation of key agencies, based on the best available science, including regional science and expertise when possible and appropriate. The goal has also been to incorporate those products into user-friendly mapping, visualization, and analysis tools made easily accessible through existing agency portals serving specific partners and stakeholders, as well as interagency venues such as the National Climate Assessment (NCA), the U.S. Climate Resilience Toolkit, and others.

The Task Force focused its initial efforts on the development of an interagency report (Sweet et al., 2017), providing updated GMSL rise scenarios focused primarily on 2100 and integrating these GMSL rise scenarios with regional factors contributing to sea level change to produce, for the first time, a set of RSL scenarios for the entire U.S. coastline. These scenarios were also a major technical input to Volumes I and II of the Fourth NCA (NCA4; USGCRP 2017, 2018) and have been widely used in the development of state (e.g., Florida[7] and Virginia [CCRM, 2019]) and local agency adaptation plans (e.g., Pensacola, Florida,[8] and Portland, Maine [One Climate Future, 2019]), and processes for anticipating and managing future coastal risks.

The Task Force's first report (Sweet et al., 2017) built upon the most current scenarios at that time (e.g., Parris et al., 2012; Kopp et al., 2014; Hall et al., 2016) and estimated the full possible range for GMSL rise by 2100 as being bounded by 0.3 m on the low end, representing a simple linear extrapolation of the GMSL rate since the early 1990s, and by 2.5 m on the high end, representing an extreme ice-sheet melt/discharge scenario. This 0.3–2.5 m range was discretized and aligned with emissions-based, conditional probabilistic storylines and global model projections into six GMSL rise scenarios: Low, Intermediate-Low, Intermediate, Intermediate-High, High, and Extreme, corresponding to GMSL rise by 2100 of 0.3 m, 0.5 m, 1.0 m, 1.5 m, 2.0 m, and 2.5 m, respectively. These GMSL rise scenarios were then used to derive regional RSL responses on a 1-degree grid covering the coastlines of the U.S. mainland, Alaska, Hawai'i, the Caribbean, and the Pacific Island territories, as well as at the precise locations of tide gauges along these coastlines.

This current report takes the Sweet et al. (2017) report as its starting point, updating the GMSL scenarios and the associated local and regional RSL projections to reflect recent advances in sea level science, as well as expanding the types of scenario information provided to better serve stakeholder needs for coastal risk management and adaptation planning. As with the 2017 report, this iteration will also serve as a key technical input to the NCA, in this case NCA5. Specific updates in this report include the following:

- While this report still uses the same nomenclature as the NOAA 2017 GMSL scenarios, it draws upon new science of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6; Fox-Kemper et al., 2021; Garner et al., 2021) to provide updated temporal trajectories and exceedance probabilities based on different levels of global warming. One effect is that the associated RSL projections for the U.S. coastline (gridded and at individual tide-gauge locations) differ in timing and magnitude as compared to the NOAA 2017 projections.
- In addition, in leveraging this updated science, including a longer observational record, improved understanding of ice-sheet dynamical processes, and better-constrained models, this report provides a more comprehensive and detailed assessment of the distinct types and range of uncertainties associated with the GMSL rise scenarios, particularly at the high end.
- By utilizing 50-year regional sets of tide-gauge data, observation-based rates and accelerations are extrapolated to the year 2050 to identify the scenario projections aligning with current RSL trajectories.
- Lastly, gridded EWL probabilities are provided, along with methods to localize them along most U.S. coastlines, to contextualize each of the regionalized sea level scenarios across a range of flood frequencies under current standards, from recurrent tidal flooding to major storm-surge flooding, out to 2050.

To frame the remainder of this report, it is important to emphasize the distinction between describing scientific progress, in terms of current understanding and key uncertainties, and translating such advances in the scientific knowledge base into actionable science. The latter requires sustained engagement by groups such as NOAA's Office of Coast Management and the Sea Grant program with users, stakeholder groups, and associated boundary organizations regarding their specific planning and decision contexts. Our development

[7] https://floridadep.gov/rcp/florida-resilient-coastlines-program/documents/proposed-rule-development-draft-62s-7-sea-level

[8] https://storymaps.arcgis.com/stories/e812723f69ad4a618c8f5f8b08cb208e

of scenarios in this report is grounded in the principles of risk-based framing for climate assessment (King et al., 2015; Weaver et al., 2017; Sutton, 2019; Kopp et al., 2019) and is consistent with adaptation pathways approaches for long-term planning. What we thus aim to provide are screening-level (suitable for first-order assessment) products appropriate for framing and bounding important problems in coastal risk assessment and management, along with contextualization of the underlying science and illustrative case studies. For example, consistent with this purpose, this report aims to provide the underlying scientific information to develop both planning- and bounding-type scenarios across the full spectrum of coastal risk; that is, 1) planning scenarios intended to frame near- to mid-term decision contexts and/or longer-term decisions with high-risk tolerance or ability to adjust plans, which address the question, What is most likely to happen? and 2) bounding scenarios designed to set the envelope of possible future outcomes, which can be used to stress-test long-term objectives, gauge the "when, not if" a given level of sea level rise might be reached, and address the question How bad could things get? *What this report does NOT provide is official guidance nor design specifications for a specific project.*

Section 2 describes advances in the understanding of the drivers of mean sea level since the 2017 report, discusses the use of observations for a near-term trajectory assessment, and provides the updated GMSL rise scenarios and their associated regional RSL projections. Section 3 focuses on high-frequency EWLs, including a regional frequency analysis of historical NOAA tide-gauge data to develop a set of EWL probabilities for assessing and projecting (to 2050) across a range of flood levels. Section 4 applies these scenarios and projections in illustrative use-case examples. Section 5 provides a summary of the report findings, as well as conclusions and next steps.

Section 2: Future Mean Sea Level: Scenarios and Observation-Based Assessments

Since Sweet et al. (2017), the observations and available data records of both sea level change and the associated processes have increased in number and length. In part due to these observations, our understanding of the drivers of sea level change has improved. There have also been significant advances in modeling how these processes will cause sea level to change in the future. This has led to an improved understanding of the possible trajectory of future sea level rise. In this report, these advances are reflected both in an update to the GMSL scenarios and a change in approach from Sweet et al. (2017). The primary change in approach is in separating this section into two different time periods: 1) near term (2020–2050) and 2) long term (2050–2150). There is also a section discussing divergence of the GMSL scenarios and tracking that is particularly relevant during the transition between the near- and long-term time periods. In the remainder of this section, a brief overview of the drivers of global and regional sea level rise is provided. Next, updates to Sweet et al. (2017) are discussed, and the motivation and scientific justification for these changes are given. Finally, the updated information for the two time periods, along with the transition between these periods, is provided.

2.1. Overview of Regional and Global Sea Level Rise

Over long, multidecadal to centennial timescales, the primary drivers of changes in GMSL are thermal expansion due to the heating of the ocean and the addition of water mass associated with ice-mass loss from the ice sheets and glaciers. Other changes in the movement of water between ocean and land, including from groundwater depletion and water impoundment, have a secondary impact on GMSL, although they can increase in importance for certain time periods (see Frederikse et al., 2020). During the 20th century, GMSL estimated from tide-gauge records has been explained by the individual processes contributing to it (see Figure 1.2a; Frederikse et al., 2020). More recently, observed GMSL from satellite altimetry over the past 15 years has been explained using the in situ measurements of the Argo profiling floats and the observations of water-mass change from the GRACE and GRACE-FO satellites (WCRP, 2018). On shorter timescales, considerable interannual and decadal variability in GMSL is linked primarily to variations in terrestrial water storage and driven heavily by the El Niño–Southern Oscillation (ENSO; Boening et al. 2012; Fasullo et al., 2013; Piecuch and Quinn, 2016; Hamlington et al., 2020a, 2020b].

At the regional level, rates of sea level rise can deviate significantly from the globally averaged rate. Sea level rise is not uniform across the globe; rather, it manifests as relative sea level (RSL) rise that also responds to several key factors important at regional and local scales (Kopp et al., 2014; Sweet et al., 2017; Hamlington et al., 2020a; Fox-Kemper et al., 2021). On short timescales and in short records, natural variations on interannual to decadal timescales can impact estimates of rates and accelerations. On long timescales, however, there are three primary causes of regional variations in estimated rates and accelerations: 1) sterodynamic sea level change; 2) gravitational, rotational, and deformational (GRD) changes due to contemporary ice-mass loss and the movement of water between land and ocean; and 3) vertical land movement (VLM; subsidence or uplift) due to glacial isostatic adjustment (GIA), tectonics, sediment compaction, groundwater and fossil fuel withdrawals, and other non-climatic factors. These three causes are discussed briefly below.

Sterodynamic sea level changes are those that arise from changes in the ocean's circulation (currents) and its density (temperature and salinity). Sea level rise associated with sterodynamic sea level change is the combination of global mean thermosteric rise associated with global ocean warming and local deviations from the global mean due to ocean dynamic processes. It is these changes in ocean dynamics that lead to regional differences. Focusing on possible causes of long-term sterodynamic sea level changes for the U.S. coastlines, future changes in the Atlantic meridional overturning circulation (AMOC) are particularly relevant. The IPCC AR6 (IPCC, 2021a) determined that it is *very likely* that the AMOC will decline in the future, although there is still disagreement as to the extent of this decline. A weakening AMOC will lead to an increase in sea level along the coastal Northeast and Southeast regions (Yin et al., 2009; Krasting et al.,

2016; see Figure A1.1 for region definitions). For the Northwest and Southwest coastal regions, ENSO plays a substantial role in interannual sea level change, although there is no clear evidence for a sustained shift in ENSO that will result in a long-term increase or decrease in sea level. Some models project future sea level changes associated with ocean dynamics to be large in magnitude in some locations, but these projections remain uncertain (Fox-Kemper et al., 2021).

The ice-mass loss from ice sheets and glaciers to the ocean has a strong influence on regional sea level. Changes in Earth's GRD responses dictate the spatial distribution of water across the global ocean (Farrell and Clark, 1976; Milne and Mitrovica, 1998; Mitrovica et al., 2001). These so-called sea level fingerprints are important to determining regional sea level rise. Mass loss causes a sea level fall in the near-field, a reduced sea level rise at intermediate distances, and a greater-than-global-average sea level rise at larger distances. For U.S. coastlines, particularly in the Northeast, this means that a similar amount of ice-mass loss in Antarctica will have a larger impact than ice-mass loss in Greenland. Similarly, ice-mass loss in Greenland leads to bigger increases in sea level along the Northwest and Southwest coastal regions than along the Northeast coastal region. At any time horizon, the regional sea level rise associated with GRD will be driven both by the amount of ice that is being lost and the source of that ice. These regional fingerprints are tied to projected trajectories of mass loss from the associated source. Changes in terrestrial water storage (groundwater withdrawal and dam building) also have an associated fingerprint, but the regional contribution is generally smaller than that from the ice sheets and glaciers.

Lastly, the VLM considered in this report refers to either subsidence or uplift that occurs in coastal regions and can lead to the change in the height of sea level relative to land. VLM is not a singular phenomenon but instead results from various processes that display different patterns in space and time. These patterns have different impacts from place to place, especially in coastal settings where many of them operate at the same time. For much of the coastal United States, subsidence is driven on local scales by groundwater and fossil fuel withdrawal and on larger scales by GIA. However, in some regions such as southern Alaska, GIA leads to high rates of uplift in coastal regions. GIA is the ongoing response of the solid earth due to ice-mass changes in the past, particularly the deglaciation after the last glacial maximum. GIA induces VLM, in particular subsidence along the U.S. East Coast, as well as changes in the gravity field, which cause local sea level changes. Accurate future projections of VLM require an understanding of the underlying processes and the time and space scales on which they vary. Currently, and in this report, VLM projections are based in part on analysis of past observations. If activities change in a particular location (e.g., reduction in groundwater pumping), an associated change in the rate of VLM will not necessarily be captured. Modeling of future VLM under a range of possible scenarios is not currently available over large scales. (See the vertical land motion use case in Section 4.4 for more information.)

Beyond these processes that impact long-term changes in sea level, there is also considerable natural (or "unforced") climate variability that can lead to significant, albeit temporary, changes to sea level on the order of years or even decades. In many of the available observational records, it can be a challenge to distinguish between these natural signals and those processes discussed above. As an example, in Figure 2.1, the regional rates of sea level rise along U.S. coastlines are shown for the first half (a, 1993–2006), second half (b, 2007–2020), and full (c, 1993–2020) satellite altimeter record (which do not measure VLM effects), along with overlaid tide-gauge rates (which measure VLM effects) measured over the same time period. A significant shift occurs from the first half of the record to the second half, with high sea level rise rates found along all coastlines of CONUS from 2007 to 2020. For the Northwest and Southwest coastal regions, in particular, the rate was near 0 for the first half of the record before shifting to almost 10 mm/year over the second half, driven by decadal variability linked to the Pacific Decadal Oscillation (PDO; e.g., Bromirski et al., 2011; Hamlington et al., 2021). For the full record, there is considerably less spatial variability, with most regions approaching the globally averaged rate of 3.1 mm/year.

In this section of the report, the contribution of natural variability is not assessed directly, but its importance and contribution should be considered when looking at observed rates and assessing possible sea level at a specific time in the future. In other words, there is an "envelope" of naturally occurring sea level variability on top of the sea level rise discussed here that needs to be included to estimate sea level at a particular location at a specific time in the future. A depiction of the relationship between sea level rise and this envelope is provided in Figure 1.3. The median of the distribution increases over time as a result of the rising sea levels, while other sea level variability on a range of timescales contributes to the spread around this central value.

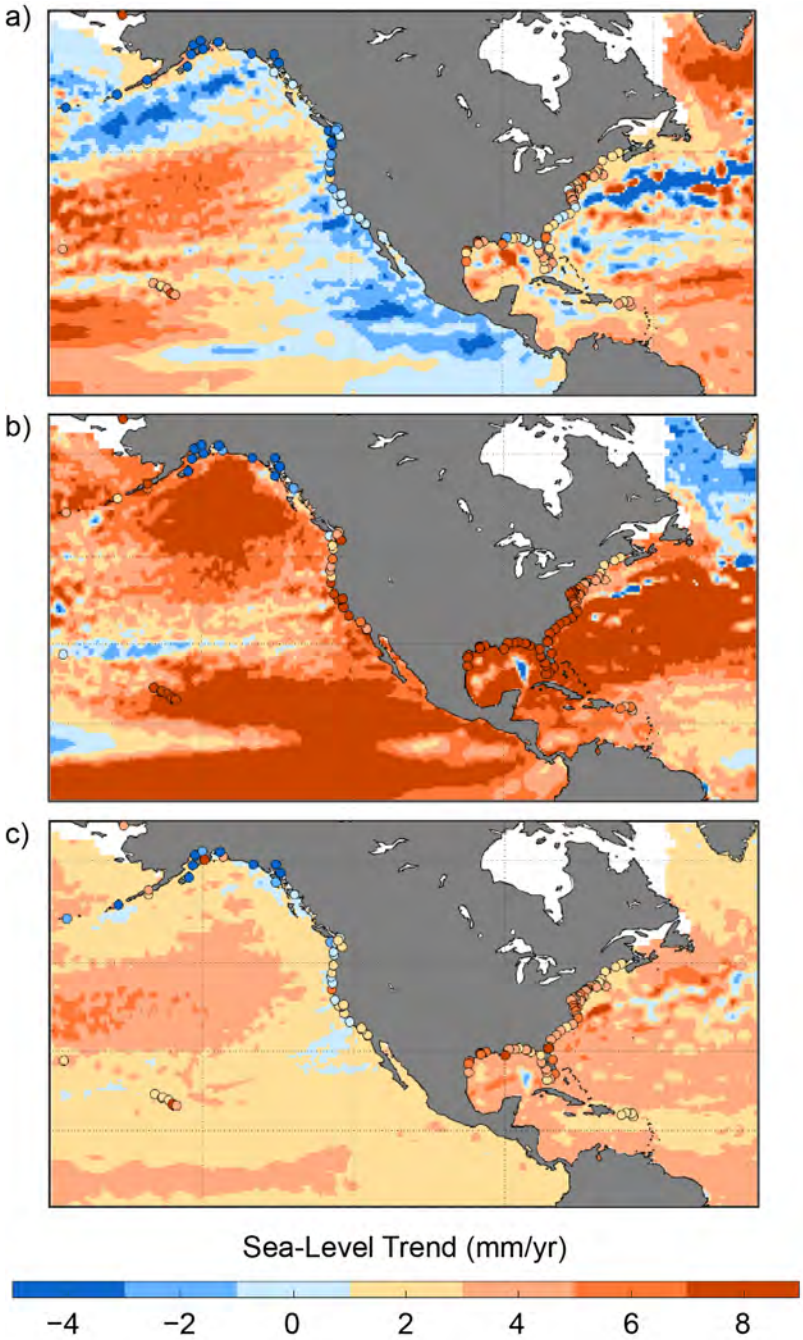

Figure 2.1: Regional sea level linear rates of rise (mm/year) from satellite altimetry over three different time periods: (a) 1993–2006, (b) 2007–2020, and (c) 1993–2020. Linear rates of change of relative sea level (ocean and land height changes) from tide gauges over the same time period are also shown (circles).

2.2. Updates from Sweet et al. (2017)

One of the main structural changes from the Sweet et al. (2017) report to this one is a specific emphasis on the near-term time period, 2020–2050. There is also a detailed discussion of GMSL scenario divergence and tracking that becomes particularly important in the transition from the near term to the long term. The motivation for the focus on these two topics is given below. Following this explanation, the primary advances in the sea level scenarios and assessments of future sea level are discussed in two subsections. The first provides an overview of the science and framework advancements that have led to an update of the scenarios first presented in Sweet et al. (2017). The second covers the inclusion of observation-based assessments of near-term sea level change for the first time.

2.2.1. Inclusion of Near-Term Time Period (2020–2050)

The dedicated focus on the near-term time period represents a new element in this report. Motivation for this change is provided briefly here. With increasing record lengths, the impact of natural sea level variability on estimated rates and accelerations diminishes, revealing more of the underlying climate change signal (see Figure 2.1c, for example). Tide gauges surrounding the U.S. coastlines provide records exceeding 100 years in some locations, and the satellite altimeter record is nearing three decades in length. Recent studies have assessed the degree to which rates and accelerations estimated from these records are reflective of the long-term increase in sea level (via satellite altimetry; e.g., Fasullo and Nerem, 2018; Richter et al., 2020) and RSL (via tide gauges; e.g., Wang et al., 2021). These studies suggest that with appropriate consideration of uncertainty, observation-based extrapolations can be informative in the near term. In this report, an assessment based solely on extrapolation of the observed rates and acceleration out to 2050 is used for trajectory tracking and a comparison to the GMSL and regional scenarios. These trajectories serve as an additional line of evidence for near-term sea level rise and provide a mostly independent (observational VLM information is shared in both) comparison to the model-based scenario. To maintain a distinction between estimates arising from observations and those coming from model-derived GMSL scenarios, the observation-based assessments are referred to in this report as “extrapolations” or “trajectories” and not as “projections.” These terms are also preceded by “observation-based” whenever used.

Beyond this renewed observational focus, the inclusion of this near-term time period is motivated by the fact that for certain decision types, short time horizons and nearer-term assessments are most relevant. For the typical lifetime of buildings and infrastructure in coastal areas, for example, a 30-year planning horizon has particular relevance (e.g., Fu, 2020; Hinkel et al., 2018). Additionally, flexible adaptation pathways and solutions typically require significant lead times on upgrades or replacements of coastal structures that necessitate assessments across a range of timescales. (Haasnoot et al., 2013, 2019; Bloeman et al., 2018; Werners et al., 2021; Hall, Harvey, and Manning, 2019). Knowing whether adaptation actions are required within the next 30 years or afterwards informs decisions about initial designs, the adaptations required, and the metrics that would trigger adaptation.

2.2.2. GMSL Scenario Divergence and Tracking

After 2050, the assessments and comparisons made using the observation-based extrapolations of future sea level rise become less informative and should be made with caution. This is because uncertainty in the current estimates of rates and accelerations leads to large projected ranges and because current estimates may not be reflective of shifts or process changes that may occur in the future with additional emissions and global warming, resulting in increasing divergence between the future GMSL scenarios after 2050. During the transition from near- to long-term assessments, an understanding of when the GMSL scenarios will diverge and what drives this divergence becomes increasingly important. Two types of uncertainty are important to consider in this context: uncertainty in physical processes and uncertainty in future emissions and ensuing warming. Although there are possible alternative definitions and framings, as used in this report, *process uncertainty* (Box 2.1) is associated with how well we currently understand why sea level has changed in the past and how it will change in the future. Stated another way, how well do we understand and model

the processes that will combine to impact sea level at a specific time and location in the future? This uncertainty is also reflected in the likely range of future sea level rise for a given GMSL scenario. The spread between the five GMSL rise scenarios is intended to reflect the range of potential future emissions pathways and associated warming levels that depends highly on global socioeconomic factors that have yet to unfold. This unknown future pathway leads to what is referred to here as *emissions uncertainty* (Box 2.1).

At some point in the future, the separation between GMSL rise scenarios will overtake the process uncertainty associated with individual GMSL rise scenarios. In other words, scenario dependence will emerge, and it will be possible to distinguish between the observation-based trajectories associated with two neighboring GMSL rise scenarios. In general, these time periods are important for connecting the near-term similarities between scenarios to the time period where scenarios diverge rapidly. An effort is made here to understand when divergence of the GMSL rise scenarios might occur and to link them to possible future warming and emissions pathways. This analysis then serves as the foundation for process-based monitoring that could be useful in determining the trajectory of ongoing sea level rise and, by extension, the possible future sea level rise out to 2150.

Box 2.1: Uncertainties

When assessing future changes in sea level, this report considers two main sources of uncertainty.

Process Uncertainty

An increase in emissions will cause ice-mass loss, ocean thermal expansion, and local ocean dynamic changes, but the sensitivity of these processes to these forcing changes comes with uncertainty. For example, the sensitivity of the Antarctic ice sheet is not yet fully understood, leading to a substantial uncertainty in how sea level reacts to forcing changes. Additionally, the future contributions from processes, such as changes in ocean circulation and VLM, that impact RSL change more locally have an associated uncertainty. This uncertainty in the contribution of these various processes to future RSL change is referred to in this report as *process uncertainty*.

Emissions Uncertainty

Increasing the amount of greenhouse gases (GHGs) in the atmosphere will trap more heat in the earth system. The amount of GHGs in the atmosphere determines the "forcing" of climate change and its effects, such as changes in temperature and sea level rise. Various forcing scenarios describe possible GHG emissions pathways, which range from quick emissions reduction to unmitigated future emissions. In the IPCC AR6 (IPCC, 2021a), these possible future pathways are referred to as Shared Socioeconomic Pathways (SSPs). The uncertainty in the future pathway is referred to as *emissions uncertainty*.

Uncertainties in this Report

In this report, emissions uncertainty and process uncertainty are combined to generate five sea level scenarios with GMSL target values in 2100: Low (0.3 m), Intermediate-Low (0.5 m), Intermediate (1 m), Intermediate-High (1.5 m), and High (2 m). These sea level scenarios are related to but distinct from the emissions pathway scenarios in the IPCC AR6.

Natural Variability

Next to sea level changes caused by changes in GHG forcing, many physical processes cause natural variations (e.g., ENSO). The scenarios and uncertainty ranges for each scenario and for the observation-based trajectories in this report do *not* include variations due to natural variability (the decadal scenario values are 19-year averages that remove most variability effects). Natural variability is not directly considered a source of uncertainty in the context of this report but does contribute to the uncertainty range in the observation-based extrapolations, as it can influence the estimated rates and accelerations in observational records. Natural, or non-forced, variations can also make significant contributions to sea level on a wide range of timescales. For example, along the U.S. West coast, sea levels are higher during El Niño years. When assessing sea level at a specific location and time in the future, the sea level contribution from natural variability must be combined with the scenarios and trajectories provided here.

2.2.3 Updates to the 2017 Sea Level Scenarios

In order to support decision-making efforts related to future sea level risks, past interagency efforts (Parris et al., 2012; Hall et al., 2016; Sweet et al., 2017) have defined a set of GMSL rise scenarios spanning a range from a Low scenario, consistent with no additional GMSL acceleration, to a worst-case, or high-end, Extreme scenario, judged to be at the physically plausible limits based on the scientific literature. In Sweet et al. (2017), these scenarios were developed to span a range of 21st-century GMSL rise from 0.3 m to 2.5 m. Sweet et al. (2017) built these scenarios upon the probabilistic emissions scenario–driven projections of Kopp et al. (2014). Kopp et al. (2014) combined a variety of different lines of evidence—global climate model (GCM) projections, the IPCC AR5 assessment of ice-sheet changes, and structured expert-judgment ice-sheet projections, among other sources of information—to generate distributions of future global and associated regional sea level changes consistent with low, medium, and high emissions scenarios. Sweet et al. (2017) filtered the ensemble of different future projections generated by Kopp et al. (2014) to identify those subsets consistent with 0.3 m, 0.5 m, 1.0 m, 1.5 m, 2.0 m, and 2.5 m of 21st-century GMSL rise. These subsets constituted the six Sweet et al. (2017) GMSL scenarios. For most purposes, Sweet et al. (2017) focused on the median of each subset, although 17th and 83rd percentile levels were also reported.

This report retains the Sweet et al. (2017) scenarios (except the Extreme 2.5 m scenario, discussed below), with the principal difference being updated temporal trajectories and exceedance probabilities now based on global warming levels rather than emissions scenarios. Linking to global warming levels provides a straightforward physical link for the GMSL scenarios and establishes a connection to global temperature monitoring efforts. The updates made in this report reflect the underlying ensemble of future projections based on methods used in the IPCC AR6 (Fox-Kemper et al., 2021; Garner et al., 2021) and listed in Table A1.1. As in Sweet et al. (2017), these projections are filtered based on 21st-century GMSL rise. In other words, projected pathways that intersect the GMSL scenario target values in 2100 are retained and then used to generate the GMSL scenarios from Low to High described here.

In addition to being updated based on the latest generation of GCMs and the IPCC AR6, this set of projections incorporates multiple methods of projecting future ice-sheet changes, which are the major sources of future sea level rise and pose the biggest source of uncertainty in projecting the timing and magnitude of future possible rise amounts. For Antarctica, this includes emulators derived from two different ice-sheet model intercomparison exercises (Edwards et al., 2021; Levermann et al., 2020), as well as from a single-model study focused on the potentially high-impact but uncertain-likelihood marine ice cliff instability (MICI) mechanism (DeConto et al. 2021) and a structured expert-judgment study (Bamber et al, 2019). For Greenland, this includes a single intercomparison-derived emulator (Edwards et al., 2021) and a structured expert-judgment study (Bamber et al., 2019). There is now a broader range of both Antarctic and Greenland potential contributions, compared to Sweet et al. (2017). Whereas the high-end scenarios of Sweet et al. (2017) were all dominated by Antarctic contributions, the potential for high Greenland contributions now also adds to these high-end scenarios, and due to its proximity, also drives larger differences along U.S. coastlines.

The use of multiple methods, including methods that consider mechanisms that could substantially increase ice-sheet sensitivity under high emissions scenarios, means that the time path of the higher GMSL scenarios is more realistic than in Sweet et al. (2017), which assumed (based on the underlying Kopp et al. [2014] projections) that ice-sheet loss would accelerate at a constant rate over the remainder of the century. A result is that there is less acceleration in the higher scenarios until about 2050 and greater acceleration toward the end of this century. This has two primary implications. First, despite maintaining the same target values and having the same range between scenarios in 2100, the range covered by the scenarios is smaller in the near term than in Sweet et al. (2017). Second, the likely (17th–83rd percentile) ranges of projections consistent with each scenario before and after the 2100 time point used to define the scenarios tend to be broader than in Sweet et al. (2017).

An important change from the Sweet et al. (2017) report is the exclusion of the Extreme (2.5 m) scenario in this report. Based on the most recent scientific understanding and as discussed in the IPCC AR6, the uncertain physical processes such as ice-sheet loss that could lead to much higher increases in sea level are now viewed as less plausible in the coming decades before potentially becoming a factor toward the end of the 21st century and beyond. A GMSL increase of 2.5 m by 2100 is thus viewed as less plausible, and the associated scenario has been removed from this report. Nevertheless, the increased acceleration in the late 21st century and beyond means that the other high-end scenarios provide pathways that potentially reach this threshold in the decades immediately following 2100 (and continue rising).

2.2.4. Observation-Based Extrapolations

As discussed above, the pathways of the updated GMSL scenarios differ from those presented in Sweet et al. (2017), and the range between the scenarios in the near term is now reduced. This report, for the first time, includes observation-based extrapolations to serve as a near-term (2020–2050) comparison for the scenarios. They can also be viewed as "trajectories" of current sea level rise. When interpreting these extrapolations, they should be considered as an additional line of evidence for near-term sea level rise alongside the model-based GMSL scenarios. They are not intended to replace the GMSL scenarios. Additionally, such observation-based extrapolations, or trajectories, can be potentially misleading if not appropriately constrained. This report makes no detailed assessment of whether the long-term rate and acceleration have emerged from the influence of natural variability in the observational record, although recent studies suggest this could be the case in some regions (Lyu et al., 2014; Richter et al., 2020; Fasullo and Nerem, 2018; Wang et al., 2021). Instead, the observation-based extrapolations are presented as computed and without interpretation after several methodological choices were made to generate extrapolations that can be compared to the scenarios and identify those scenarios that "bound" the 2050 extrapolations. These methodological choices are described briefly below.

First, the rates and accelerations are estimated from the tide-gauge records starting in 1970. Recent studies have shown a consistent acceleration in GMSL since 1970 (Dangendorf et al., 2019; Frederikse et al., 2020), and this is a primary motivator for the time period chosen. The impact of varying this start date on the regional scales relied on here was assessed and found to be negligible within a few years of 1970 (more below). This is not true, as a general statement, when using individual tide-gauge records. Second, the observation-based extrapolations are made only to 2050. Beyond that date, it is assumed that processes not fully represented in the observations could become dominant. Third, the uncertainty in the rate and acceleration associated with the influence of natural variability is accounted for as fully as possible and included in the extrapolation. Finally, the extrapolations are made for GMSL, the coastlines of CONUS, and 10 separate coastal regions around the United States and outlying islands (see Figure A1.1 for region definitions). By grouping tide gauges regionally, the influence of localized variability is reduced, and challenges associated with individual tide gauges with incomplete or short records are overcome, thus yielding more useful and narrower extrapolated ranges. These regional comparisons also fulfill the intent of providing an additional line of evidence and comparison point to the GMSL scenarios.

For each individual region, the observation-based extrapolation is performed as follows:

1. The tide gauges in the region are grouped and combined following the virtual station method (see Frederikse et al., 2020) to generate a monthly time series of RSL from 1920 to present.
2. Natural variability is partially removed through regression analysis using climate indices representing the El Niño–Southern Oscillation, Pacific Decadal Oscillation, and North Atlantic Oscillation (see Calafat et al., 2012; Hamlington et al., 2021).
3. The rate and acceleration from 1970 to present is computed, and the uncertainty on each term is assessed, accounting for the influence of remaining natural variability (see Hamlington et al., 2021) and serially correlated variability in the tide-gauge record (Bos et al., 2013, 2014).

4. The rates, accelerations, and uncertainties are used to generate an ensemble of 5,000 extrapolations with a baseline year of 2000 and extending to 2050. Median projections and a likely (17th–83rd) range are computed from this ensemble.

Following this procedure, observation-based extrapolations are obtained for GMSL, CONUS, and 8 coastal regions (Figure A1.1)—the Northeast (Maine to Virginia), the Southeast (North Carolina to the east coast of Florida), the Eastern Gulf (west coast of Florida to Mississippi), the Western Gulf (Louisiana to Texas), the Southwest (California), the Northwest (Oregon to Washington), the Hawaiian Islands, and the Caribbean. Elsewhere in the report, projections are discussed for the Pacific Islands, but due to the availability of tide-gauge data and the geographic range covered by the region, the extrapolations are conducted using only those gauges on the Hawaiian Islands. Observation-based extrapolations are also made for the southern and northern coasts of Alaska and mentioned in the text but not included in the tables below. Differential VLM heavily impacts the tide-gauge records along the southern coastline of Alaska and makes the creation of a regionally representative time series challenging. The observation-based extrapolations for Alaska are thus caveated with increased uncertainty in the underlying regional processes that heavily limit their utility as a comparison to the GMSL scenarios.

2.3. Near-Term Sea Level Change (2020–2050)

In Sweet et al. (2017), the range between the median values of the Low and High GMSL scenarios in 2020, 2030, 2040, and 2050 was 0.05 m, 0.12 m, 0.23 m, and 0.38 m, respectively. As a result of improved science and the updated framework and procedure for generating the GMSL scenarios, the time path of the scenarios—particularly the higher scenarios—is now more realistic and consistent with current process-based understanding. In this report, the range between the Low and High scenarios in 2020, 2030, 2040, and 2050 is now 0.02 m, 0.06 m, 0.15 m, and 0.28 m, respectively (Table 2.1). In other words, there is less divergence between the GMSL scenarios in this near-term time period, which reduces uncertainty in the projected amount of GMSL rise up to the year 2050. The Low scenario remains largely the same between this report and Sweet et al. (2017); this range reduction reflects a downward shift in the higher scenarios in 2050 and times prior, as discussed above. As an example, the projected value in 2050 for the High scenario in this report (~0.4 m) is the same as that for the Intermediate-High projected value in 2050 in Sweet et al. (2017). In short, while the scenarios continue to be defined by projected values of GMSL increase in 2100, it is important to note that the paths to get to these target values have changed in this report compared to the previous one.

Following the procedure outlined in Section 2.2.4, an observation-based extrapolation of GMSL is computed using the global tide-gauge reconstruction from Frederikse et al. (2020; Figure 2.2a; also see top row of Table 2.1). The extrapolated value of GMSL increase in 2050 relative to a baseline of 2000 is 0.24 m, with a likely (17th–83rd percentile) range between 0.19 m and 0.29 m. A similar extrapolation was made using GMSL data measured by satellite altimeters over 1993–2021, resulting in an estimate of 0.23 m of rise from 2000 to 2050 and in agreement with the results of the tide-gauge extrapolation. Based on the updated GMSL scenarios, the median of the 2050 observation-based extrapolation is bounded by (i.e., it falls between) the Intermediate-Low and Intermediate scenarios. The likely ranges for the Low and High scenarios do not overlap with the likely range of observation-based extrapolation in 2050, although the very likely ranges (5th–95th percentiles) do overlap. The likely range of the Intermediate-High scenario does overlap with the likely range of the observation-based extrapolation. A similar observation-based extrapolation is completed using only the tide gauges located around CONUS (Figure 2.2b), resulting in a projected increase of 0.38 m in 2050, with a likely range of 0.32 m to 0.45 m. This range for CONUS is again narrower than in Sweet et al. (2017). Similar to GMSL, this observation-based assessment is bounded by the Intermediate-Low and Intermediate scenarios in 2050.

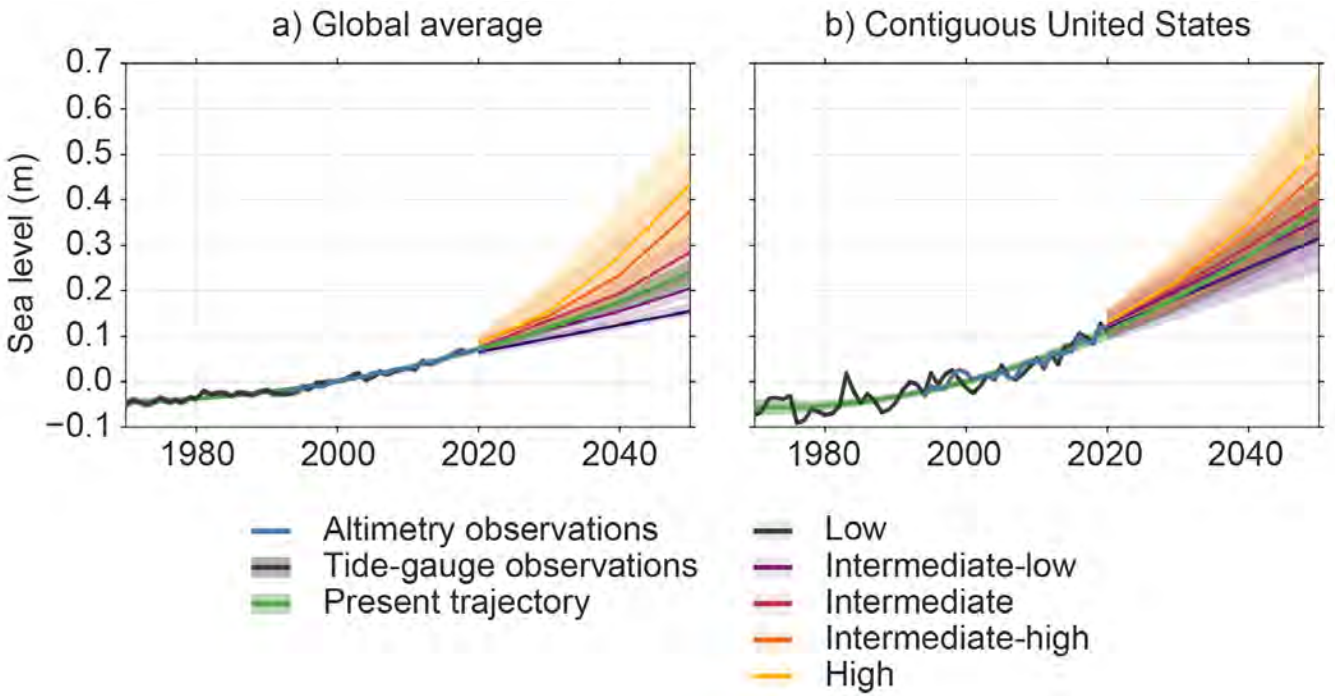

Figure 2.2: Observation-based extrapolations using tide-gauge data and five Scenarios, in meters, for a) global mean sea level and b) relative sea levels for the contiguous United States from 2020 to 2050 relative to a baseline of 2000. Median values are shown by the solid lines, while the shaded regions represent the likely ranges for the observation-based extrapolations and each scenario. Altimetry data (1993–2020) and tide-gauge data (1970–2020) are overlaid for reference.

As a result of the smaller region used and the increased influence of natural variability and VLM, the likely ranges in 2050 for CONUS in both the scenario projections and observation-based extrapolations are larger than those associated with the GMSL scenarios themselves. The likely range from the observation-based extrapolation does overlap with the likely ranges from both the Low and High scenarios. This is both a reflection of the larger range in the extrapolation for CONUS and the narrower range between the High and Low scenarios in this report. A key takeaway from this assessment is that on global and national scales, two lines of evidence (observations and GMSL scenarios) are consistent out to 2050 and support a narrower range in possible near-term sea level change than provided in Sweet et al. (2017). As discussed previously, this is consistent with and a result of the improved process-based understanding and projection approach that has been incorporated in this report.

The observation-based extrapolations are also computed for 10 coastal regions of the United States. Only 8 of these regions are shown in the tables and figures below, with the coastlines of Alaska covered separately in the text. As in the global and national cases, the observation-based extrapolations are extended out to 2050. Following the procedure outlined in section 2.2.4, tide gauges within each of these regions are combined into a single time series prior to extrapolating estimated rates and accelerations. Building on the discussion in section 2.2.4, the motivation for doing these assessments regionally as opposed to at each individual tide gauge location is two-fold. First, the observation-based extrapolations are intended to serve as a comparison to the model-based GMSL scenarios. Outside the possibility of very localized VLM, the processes included in the regionalized GMSL scenarios are generally spatially coherent over the regions considered. Indeed, the selection of specific regions is driven by process-based similarities mostly associated with ocean dynamics and large-scale VLM. Grouping the tide gauges and generating regional comparisons yields a closer analog to the information contained in the scenarios. The regional averages also reduce the influence of local signals—including VLM and other natural ocean variability—that can influence extrapolations and associated ranges. Second, some of the individual tide gauges around the U.S. coastlines have records that either do not span the full time period from 1970 to 2020 or contain data gaps. Generating

Table 2.1: Observation-based extrapolations and five scenarios, in meters, for global mean sea level and relative sea level for the contiguous United States from 2020 to 2050 relative to a baseline of 2000. Median [likely ranges] are shown.

Global Mean Sea Level				
	2020	2030	2040	2050
Obs. Extrapolation	0.07 [0.06, 0.08]	0.12 [0.11, 0.13]	0.18 [0.16, 0.19]	0.24 [0.19, 0.29]
Low	0.06 [0.05, 0.07]	0.09 [0.08, 0.10]	0.12 [0.11, 0.13]	0.15 [0.14, 0.17]
Intermediate-Low	0.07 [0.06, 0.07]	0.11 [0.09, 0.12]	0.15 [0.13, 0.17]	0.20 [0.18, 0.23]
Intermediate	0.07 [0.07, 0.09]	0.13 [0.11, 0.15]	0.19 [0.16, 0.23]	0.28 [0.22, 0.32]
Intermediate-High	0.08 [0.07, 0.10]	0.14 [0.11, 0.20]	0.23 [0.18, 0.32]	0.37 [0.27, 0.46]
High	0.08 [0.07, 0.10]	0.15 [0.11, 0.22]	0.27 [0.18, 0.39]	0.43 [0.31, 0.57]
Contiguous United States				
	2020	2030	2040	2050
Obs. Extrapolation	0.11 [0.09, 0.13]	0.19 [0.16, 0.21]	0.28 [0.23, 0.32]	0.38 [0.32, 0.45]
Low	0.12 [0.09, 0.15]	0.18 [0.14, 0.23]	0.25 [0.19, 0.31]	0.31 [0.24, 0.39]
Intermediate-Low	0.13 [0.10, 0.16]	0.20 [0.15, 0.25]	0.28 [0.22, 0.34]	0.36 [0.28, 0.44]
Intermediate	0.13 [0.10, 0.16]	0.21 [0.16, 0.26]	0.30 [0.23, 0.37]	0.40 [0.31, 0.49]
Intermediate-High	0.13 [0.10, 0.16]	0.22 [0.16, 0.28]	0.33 [0.24, 0.43]	0.46 [0.35, 0.61]
High	0.13 [0.10, 0.16]	0.22 [0.17, 0.29]	0.35 [0.26, 0.47]	0.52 [0.39, 0.68]

regional time series alleviates these challenges and allows us to provide generalized comparisons and assessments about the match between observations and model-based scenarios along the U.S. coastlines. These regional comparisons then provide an additional line of evidence for the possible overall trajectory of sea level in the near term. The result is shown in Figure 2.3, with corresponding values in Table 2.2 for each of the eight regions and compared to the scenarios in each region.

The regional differences in the observation-based extrapolations and scenarios in Figure 2.3 are consistent with the current process-based understanding of sea level rise. Processes such as ocean dynamics, the GRD response to contemporary ice-mass loss (i.e., fingerprints), and coastal VLM lead to differences between the eight regions. Additionally, uncertainty ranges on the extrapolations can be bigger or smaller depending on the number of tide gauges in a particular region and the influence of natural variability on the rate and acceleration estimates. To demonstrate this regionalization, Figure 2.4 shows these regional variations of sea level in 2050 for the Intermediate-Low and Intermediate-High scenarios. In 2050, the regional variation in future sea levels does not change significantly between scenarios. Although the values increase from the Intermediate-Low scenario to the Intermediate-High scenario, the east–west difference in sea level rise is similar. Higher values for both scenarios are found along the entire East and Gulf Coasts. Subsidence leads to the highest rates along the Gulf Coast, driven by regional and local factors, such as river sediment compaction and withdrawal of subsurface fluids (Dokka, 2011; NGS, 2001; Rydlund and Densmore, 2012). Along the East Coast, subsidence is generally associated with the large-scale process of GIA, with fluid extraction being an issue in some areas (Frederikse et al., 2017; Karegar et al., 2016). Beyond VLM, many of the regional differences are driven by differences in the ocean dynamic variability. For example, the sterodynamic contribution from 2000 to 2050 in the Northeast is more than double the sterodynamic contribution in the Southwest. This regional difference is similarly reflected in the observation-based extrapolations in 2050. It should be noted that this difference arises from higher-than-global-average projections for the Northeast as opposed to lower-than-global-average projections for the Southwest, which tracks very closely to the GMSL values shown in Table 2.1.

For the observation-based extrapolations, the largest estimates of sea level rise in 2050 are found along the entire Gulf Coast (Table 2.2). The Western Gulf has the highest extrapolated values in 2050, driven by high rates of coastal subsidence in the region and consistent with the scenarios discussed above. The Northwest and Southwest coastal regions have the lowest observation-based extrapolations to 2050. For the purposes of offering a comparison to the scenarios, the scenarios that either bound or track the median of the observation-based extrapolations are provided (denoted by red text or markers in Table 2.2). Two regions track the Intermediate-Low scenario (Northeast and Hawaiian Islands), and two regions track the Intermediate scenario (Southwest and Caribbean). The Intermediate-Low to Intermediate scenarios bound the Northwest, and the Intermediate to Intermediate-High scenarios bound the Southeast and Western Gulf regions. Finally, the Intermediate-High to High scenarios bound the Eastern Gulf region. With only the exceptions of the low-end scenarios in the Southwest and Eastern Gulf, the likely ranges from the observation-based extrapolations have at least some overlap with the likely ranges of all the scenarios within a given region. This is due to a combination of the larger uncertainty on the observation-based assessments at these regional levels for an individual scenario and the narrower ranges between the median values of each GMSL scenario found in this report compared to Sweet et al. (2017). While not shown in Table 2.2, the observation-based extrapolation for the northern coast of Alaska in 2050 (median value of 0.27 cm) is bracketed by the Intermediate and Intermediate-High scenarios. The extrapolation of the southern coast of Alaska leads to a large RSL decrease in 2050 and is inconsistent with the scenario median values. As mentioned above, this is a result of challenges in generating a representative tide-gauge time series to use in the extrapolation.

As a note on the interpretation of the results provided in this near-term section, the regional comparisons between the observation-based extrapolations and scenarios need to be considered in the context of the global comparison in Figure 2.2. The regional scenarios are intrinsically linked to their associated GMSL target values in 2100. In an ideal framework that perfectly represented the regionalization of these GMSL scenarios and the relevant regional processes, separate comparisons on a regional level would be unnecessary. In other words, all regions and locations would track the same GMSL scenario. Since this is not the case, if a particular region deviates from the others, it would be an indication that either the observation-based extrapolation for that region is biased high or low or that the framework used to generate the regionalization of the GMSL scenarios is not adequately representing the contribution of a regional process. Since the observed GMSL trajectory is near the Intermediate-Low scenario, as shown here, based on the current understanding of the processes driving regional RSL, it is not expected that a particular region would track a much higher scenario. These regional comparisons during the near-term time period then serve two potential purposes: 1) they provide an additional line of evidence along with the GMSL and CONUS comparisons for the near-term trajectory of sea level rise, and 2) they can serve to identify cases when the contributions of regional processes may be tracking differently than represented by the regionalization of the GMSL scenarios.

As a general assessment of these two purposes, the likely ranges of all but one of the regions are either bounded on one side by the Intermediate scenario or tracks a scenario neighboring the Intermediate scenario, showing some level of consistency with the GMSL and CONUS comparisons. This provides additional confidence in the narrower range (when compared to Sweet et al., 2017) of sea level rise at the regional level out to 2050 presented in this report. The Eastern Gulf is the only region bounded by the High scenario. The high observation-based extrapolation for the Eastern Gulf should be interpreted with caution, as it does not necessarily mean a higher scenario is applicable compared to other regions. As a possible explanation, unresolved natural ocean variability in the observational record could lead to an observation-based extrapolation that is biased high. Such variability would need to be low-frequency—or long period—to significantly impact a rate and acceleration estimated in a 50-year record. For all regions considered here, it is likely that natural variability still contributes to the median observation-based extrapolation, and as seen in Figure 2.1, this variability has a substantial impact on the coastlines of the United States. This influence of natural variability on rates and accelerations is captured to the extent possible in the likely ranges of the observation-based extrapolations, and these likely ranges should be considered in tandem with the median values

when assessing near-term trajectories. Beyond the possible influence of natural variability, there may also be a mismatch in the process representation between the observations and regionalized, model-based GMSL scenarios that leads to a projection that is too low in the latter. One possibility is non-linear or unresolved VLM in the region. The regionalized GMSL scenarios consider only long-term linear rates of VLM, while the observation-based extrapolations could represent a shift in the rate of VLM in the estimated acceleration.

An explanation of regional differences between observation-based extrapolations and model-based scenarios requires additional investigation, likely on a tide gauge-by-tide gauge basis. As a first step in this direction, the range between Low and High scenarios at each individual tide gauge (considering only the tide gauges with at least 30 years of data—102 of the full set of 121) is provided in Figure A1.2a, and the departure between the observation-based extrapolation and Intermediate scenario at each individual tide gauge is shown in Figure A1.2b. These figures show that the range between Low and High scenarios is generally lower than 20 cm in 2050 at the local level and that most observation-based extrapolations are within 15 cm of the Intermediate scenario in 2050. Of the 102 tide gauges used in this report, 65 have observation-based extrapolations that fall within the narrower Low to High ranges in 2050, and 80 of these 102 are within 15 cm of the Intermediate scenario. The majority of those falling below the Low scenario are found in the Northwest and southern Alaska regions, and the majority of those exceeding the High scenario are found in the two Gulf regions. This supports the regional comparisons shown in Figure 2.3 and Table 2.2 while also conveying that there is general agreement and consistency between the ranges of the observation-based extrapolations and regionalized GMSL scenarios even on a local, tide gauge-by-tide gauge level. A more definitive assessment of why some regions track higher (e.g., Eastern Gulf) or lower relative to others requires further analysis that should be done with consideration of the associated uncertainty and ranges.

As a general concluding statement on this near-term section, the link between the regional and global scenarios needs to be considered when drawing conclusions at the regional level based on the observation-based extrapolations. In practice, regionally identifying the scenario that upper-bounds the observation-based extrapolation at year 2050 (Table 2.2) may help compensate for potential interannual variability when projecting sea level for a particular location. The associated uncertainties in the approaches adopted here do emphasize the importance of ongoing monitoring using the observations and the need to update trajectories. As records continue to lengthen, likely ranges on near-term assessments will narrow. Additionally, satellite altimeter records are reaching sufficient length to be important in such monitoring. As a final note, the same framework used for extrapolating the observations forward can also be used to assess the increases—or offsets—observed over different recent time periods. These offsets are useful for adjusting baselines of the scenarios and are provided for each region in Table A1.2.

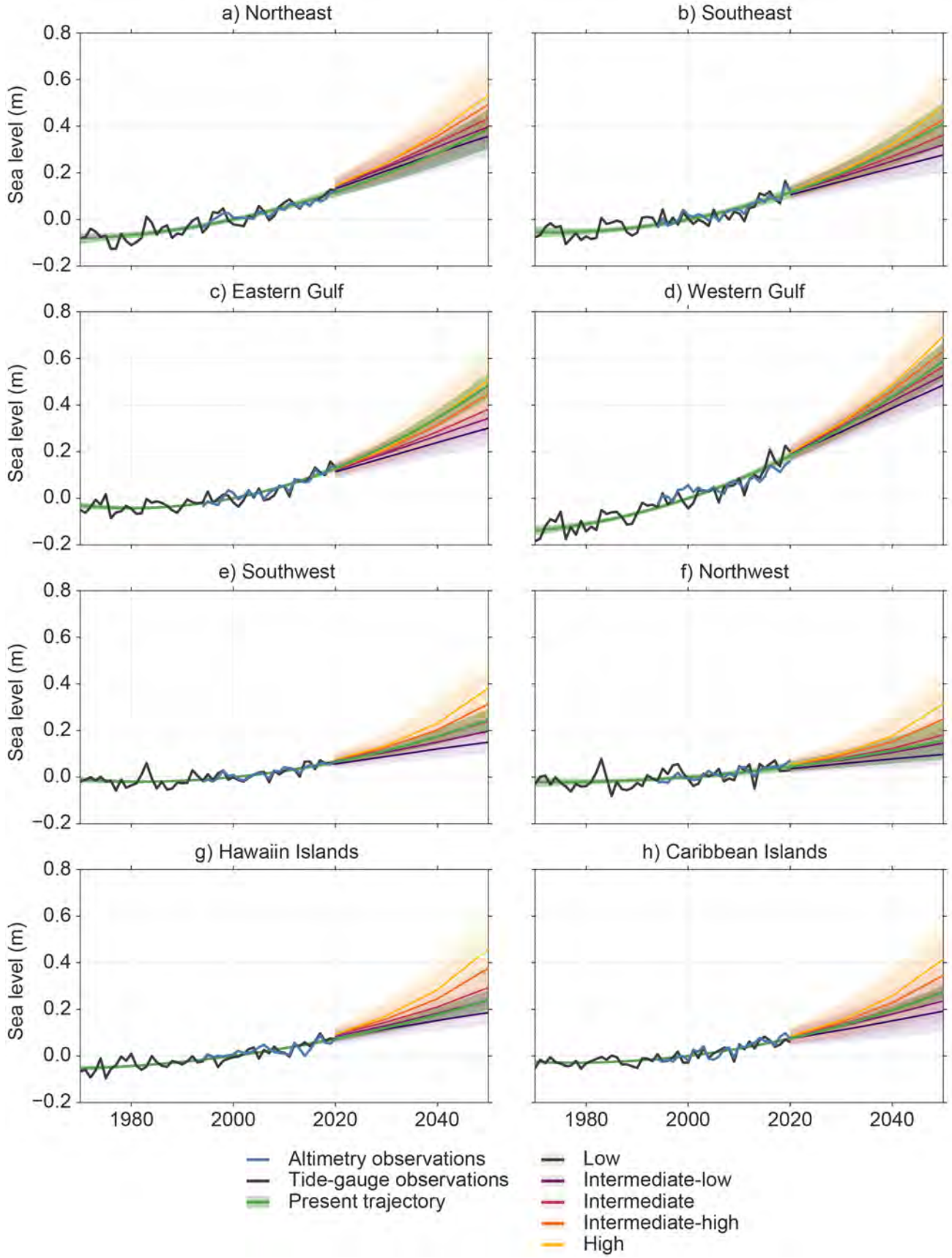

Figure 2.3: Observation-based extrapolations and five regionalized global mean sea level scenario projections, in meters, of relative sea levels for eight coastal regions around the United States from 2020 to 2050 relative to a baseline of 2000. Median values are shown by the solid lines, while the shaded regions represent the likely ranges for the observation-based extrapolations and each scenario. Tide-gauge data (1970 to 2020) are overlaid for reference, along with satellite altimetry observations, which do not include contributions from vertical land motion.

Table 2.2: Observation-based extrapolation and regionalized global mean sea level scenario–based estimates, in meters, of relative sea level in 2050 relative to a baseline of 2000 for eight coastal regions of the United States. Median [likely ranges] are shown. The two scenarios that bound the median observation-based extrapolation are also provided for each region and indicated by red dividing lines. In regions where the observation-based extrapolation is the same as a particular scenario, the scenario is indicated in red text and the bounding scenarios can be assumed to be the next higher or lower scenario (e.g., the Intermediate bounds the Northeast's observation-based extrapolation).

Observation Extrapolations	Low	Intermediate-Low	Intermediate	Intermediate-High	High	Median Bounding Scenarios
Northeast						
0.40 [0.30, 0.47]	0.36 [0.27, 0.45]	0.40 [0.31, 0.49]	0.43 [0.34, 0.54]	0.49 [0.38, 0.64]	0.54 [0.40, 0.69]	Int-Low
Southeast						
0.41 [0.32, 0.50]	0.28 [0.20, 0.35]	0.32 [0.25, 0.40]	0.36 [0.28, 0.46]	0.43 [0.32, 0.58]	0.49 [0.35, 0.64]	Int–Int-High
Eastern Gulf						
0.48 [0.43, 0.54]	0.30 [0.22, 0.38]	0.34 [0.26, 0.42]	0.38 [0.30, 0.48]	0.45 [0.34, 0.60]	0.51 [0.38, 0.68]	Int-High–High
Western Gulf						
0.59 [0.51,0.67]	0.49 [0.41, 0.57]	0.53 [0.44, 0.62]	0.57 [0.47, 0.67]	0.63 [0.51, 0.79]	0.69 [0.56, 0.87]	Int–Int-High
Southwest						
0.24 [0.20,0.29]	0.15 [0.10, 0.20]	0.20 [0.14, 0.26]	0.24 [0.18, 0.32]	0.31 [0.22, 0.45]	0.38 [0.26, 0.54]	Intermediate
Northwest						
0.16 [0.08, 0.24]	0.10 [0.05, 0.15]	0.15 [0.09, 0.20]	0.18 [0.12, 0.26]	0.25 [0.15, 0.39]	0.31 [0.19, 0.47]	Int-Low–Int
Hawaiian Islands						
0.24 [0.20, 0.28]	0.19 [0.13, 0.24]	0.24 [0.18, 0.31]	0.29 [0.22, 0.39]	0.38 [0.27, 0.53]	0.46 [0.31, 0.64]	Int-Low
Caribbean						
0.28 [0.24, 0.31]	0.19 [0.10, 0.29]	0.24 [0.14, 0.33]	0.28 [0.18, 0.39]	0.35 [0.22, 0.51]	0.42 [0.27, 0.59]	Intermediate

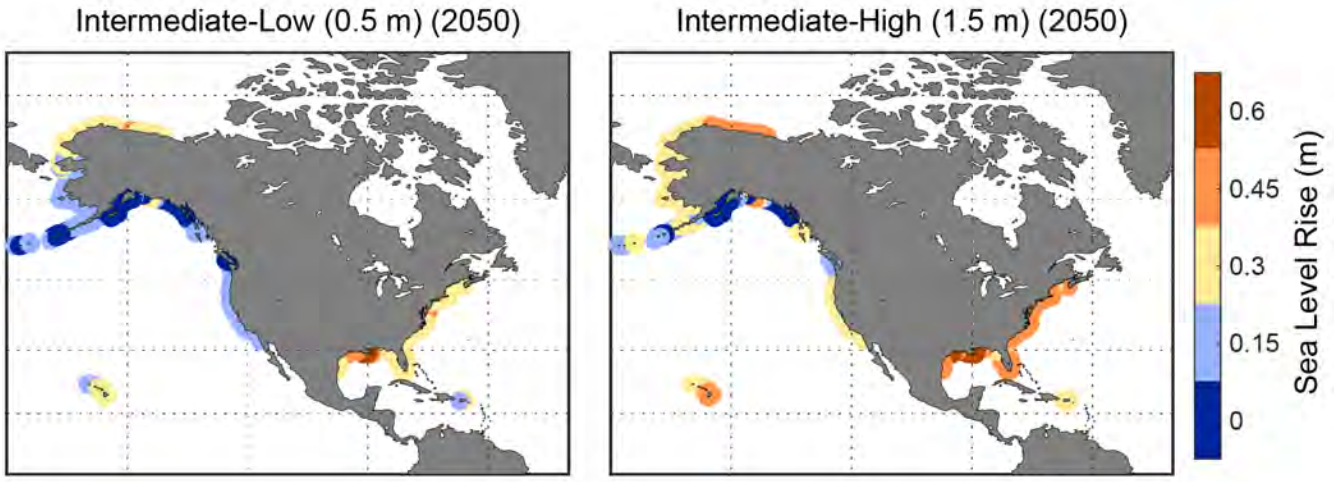

Figure 2.4: Relative sea level rise, in meters, in 2050 for the a) Intermediate-Low and b) Intermediate-High scenarios relative to the year 2000.

2.4. Long-Term Sea Level Change (2050–2150)

The updated GMSL values in 2050, 2100, and 2150 relative to a 2000 baseline are shown for each of the five scenarios in Table 2.3. Note that the current National Tidal Datum Epoch (NTDE) has a baseline of 1992 (midpoint of the 1983–2001 epoch). Comparisons between the projections here and calculations tied to the NTDE will require an adjustment between 1992 and 2000 (see Table A1.2 for offsets). Beyond the middle of this century, the differences between sea level scenarios become increasingly large, and the differences between sea level scenarios become more closely associated with differences in potential future GHG emissions pathways and associated global warming. Although the GMSL scenarios (names and their values) are the same at 2100 for this report and for Sweet et al. (2017), there is a narrowing in the range covered by the scenarios in both 2050 and 2150, driven primarily by a reduction in the values at those two target dates associated with the Intermediate-High and High scenarios in this report. As previously discussed, in 2050, the updated median value for the High scenario is similar to the median value for the Intermediate-High scenario from Sweet et al. (2017). This is not the case in 2150, however, where the separation between the scenarios remains similar to Sweet et al. (2017). Because of this, and because the scenarios are defined by the 2100 values, the same scenario naming is used in this report as in Sweet et al. (2017), with the notable exception of the omission of the Extreme (2.5 m) scenario.

In the very long term (over millennia), the magnitude of global mean sea level rise closely relates to the magnitude of global warming; however, over the timescales of decades and centuries, the magnitude of global warming more closely relates to the *rate* of GMSL rise. It is thus not possible to tie specific levels of warming in general to amounts of sea level rise, but it is possible to relate specific levels of warming *at specific points in time* (e.g., at the end of the century) to different levels of sea level rise. Thus, based on the IPCC AR6 (§9.6.3.4 in Fox-Kemper et al., 2021), it is possible to connect the GMSL rise scenarios to different levels

Table 2.3: Global mean sea level and contiguous United States scenarios, in meters, relative to a 2000 baseline.

Global Mean Sea Level				Contiguous United States			
	2050	**2100**	**2150**		**2050**	**2100**	**2150**
Low	0.15	0.3	0.4	Low	0.31	0.6	0.8
Intermediate-Low	0.20	0.5	0.8	Intermediate-Low	0.36	0.7	1.2
Intermediate	0.28	1.0	1.9	Intermediate	0.40	1.2	2.2
Intermediate-High	0.37	1.5	2.7	Intermediate-High	0.46	1.7	2.8
High	0.43	2.0	3.7	High	0.52	2.2	3.9

of future global mean surface air temperature occurring at the end of the century. The median GMSL projection for 2100 for a world with global mean surface air temperature in 2081–2100 averaging 2.0°C above 1850–1900 levels is about 0.5 m (*likely* range of 0.4–0.7 m; Table 2.4), consistent with the Intermediate-Low scenario. The median GMSL projection for a world with global mean surface air temperature in 2081–2100 averaging 4.0°C higher is about 0.7 m (*likely* range of 0.6–0.9 m), between the Intermediate-Low and Intermediate scenarios, with the upper end of the *likely* range approaching the Intermediate scenario. These two scenarios are also consistent with the current observed acceleration, which, if extrapolated, would yield about 0.24 m of GMSL rise by 2050 and 0.69 m by 2100.

However, these projections include only physical processes in which there is at least *medium confidence* in the current scientific understanding. As described in the IPCC AR6 (Box 9.4 in Fox-Kemper et al., 2021), the largest potential contributions to long-term GMSL rise come from ice-sheet processes in which there is currently *low confidence*. Projections that include the magnitudes, rates, and thresholds associated with these ice-sheet processes, particularly under higher emissions futures, could give rise to GMSL rise values well above the *likely* range. Pathways to such unknown-likelihood, high-impact outcomes—"potential surprises" in the words of NCA4 (Kopp et al., 2017)—include

- earlier-than-projected ice-shelf disintegration in Antarctica,
- abrupt, widespread onset of marine ice-sheet instability and/or marine ice-cliff instability in Antarctica, and
- faster-than-projected changes in surface-mass balance on Greenland, potentially associated with changes in atmospheric circulation, cloud processes, or albedo changes.

These outcomes are represented in the IPCC projections (§9.6.3 in Fox-Kemper et al., 2021) through the inclusion of an illustrative very high emissions (SSP5-8.5), *low-confidence* projection range, the 83rd percentile of which for 2100 extends to 1.6 m (modestly above the Intermediate-High scenario) and the 95th percentile of which extends to 2.3 m (above the High scenario). In 2150, the 83rd and 95th percentiles of this *low-confidence* scenario are 4.8 and 5.4 m, respectively. Because these outcomes are based on processes poorly represented in climate and ice-sheet models, the IPCC assessment of these processes incorporates information from a structured expert-judgement study (Bamber et al., 2019) and a single Antarctic ice-sheet modeling study that explicitly incorporates ice-shelf hydrofracturing and ice-cliff collapse mechanisms (DeConto et al., 2021). (See §9.6.3.2, §9.6.3.3, and Box 9.4 of Fox-Kemper et al., 2021, for further discussion.)

To connect this to the scenarios provided here, the Intermediate-High and High scenarios represent potential futures in which these deeply uncertain ice-sheet processes play important roles in the late 21st century and beyond. After 2100, these processes may also play important roles in the Intermediate scenario. These trajectories are highly emissions-dependent. For example, in an illustrative low emissions (SSP1-2.6) future, in which the world achieves net-zero carbon dioxide emissions by the 2070s and net-negative emissions thereafter, the corresponding AR6 l*ow-confidence* ranges in 2100 extend to 0.8 m at the 83rd percentile (between the Intermediate-Low and Intermediate scenarios) and 1.1 m at the 95th percentile (modestly above the Intermediate scenario), reaching 1.3 m (between the Intermediate-Low and Intermediate scenarios) and 1.9 m (consistent with the Intermediate scenario), respectively, in 2150. Thus, in a low emissions future, there is little evidence to support the plausibility of GMSL projections substantially higher than the median Intermediate scenario.

These warming levels are further compared to the five scenarios in this report by assessing the probability that the given GMSL value in 2100 will be exceeded for a particular warming level (Table 2.4). At all warming levels, there is at least a 92% chance of *exceeding* the Low scenario in 2100. The probability for exceeding the Intermediate-Low (0.5 m) scenario drops for all warming levels when compared to the probability for exceeding the Low scenario. For the Intermediate, Intermediate-High, and High scenarios, the probability drops

off at each warming level. Consistent with the framing of the five scenarios in this report, greater warming and higher emissions are generally needed to arrive at the Intermediate through High scenarios in 2100.

Table 2.4: IPCC warming level–based global mean sea level projections. Global mean surface air temperature anomalies are projected for years 2081–2100 relative to the 1850–1900 climatology. Sea level anomalies are relative to a 2005 baseline (adapted from Fox-Kemper et al., 2021). The probabilities are *imprecise probabilities*, representing a consensus among all projection methods applied. For imprecise probabilities >50%, all methods agree that the probability of the outcome stated is at least that value; for imprecise probabilities <50%, all methods agree that the probability of the outcome stated is *less than or equal to* the value stated.

Global Mean Surface Air Temperature 2081–2100	1.5°C	2.0°C	3.0°C	4.0°C	5.0°C	Unknown Likelihood, High Impact – Low Emissions	Unknown Likelihood, High Impact – Very High Emissions
Closest Emissions Scenario–Based GMSL Projection	Low (SSP1-2.6)	Low (SSP1-2.6) to Intermediate (SSP2-4.5)	Intermediate (SSP2-4.5) to High (SSP3-7.0)	High (SSP3-7.0)	Very High (SSP5-8.5)	Low (SSP1-2.6), *Low Confidence* processes	Very High (SSP5-8.5), *Low Confidence* processes
Total (2050)	0.18 (0.16–0.24)	0.20 (0.17–0.26)	0.21 (0.18–0.27)	0.22 (0.19–0.28)	0.25 (0.22–0.31)	0.20 (0.16–0.31)	0.24 (0.20–0.40)
Total (2100)	0.44 (0.34–0.59)	0.51 (0.40–0.69)	0.61 (0.50–0.81)	0.70 (0.58–0.92)	0.81 (0.69–1.05)	0.45 (0.32–0.79)	0.88 (0.63–1.60)
Bounding Median Scenarios in 2100	Low to Intermediate-Low	Intermediate-Low to Intermediate	Intermediate-Low to Intermediate	Intermediate-Low to Intermediate	Intermediate-Low to Intermediate	Low to Intermediate-Low	Intermediate-Low to Intermediate
Probability > Low (0.3 m) in 2100	92%	98%	>99%	>99%	>99%	89%	>99%
Probability > Int.-Low (0.5 m) in 2100	37%	50%	82%	97%	>99%	49%	96%
Probability > Int. (1.0 m) in 2100	<1%	2%	5%	10%	23%	7%	49%
Probability > Int.-High (1.5 m) in 2100	<1%	<1%	<1%	1%	2%	1%	20%
Probability > High (2.0 m) in 2100	<1%	<1%	<1%	<1%	< %	<1%	8%

The median regional scenario values in 2100 and 2150 for the eight coastal regions discussed in Section 2.3 are provided in Table 2.5. The values in 2100 for each region differ from the GMSL value used to define a given scenario due to the combination of regionally relevant factors that are discussed in Section 2.1. Similar to the near term, the highest values across all scenarios are found in the Western Gulf region, followed by the Eastern Gulf. These high values are heavily driven by the high rates of subsidence in the region. For all but two regions (Southwest and Northwest), the projected values exceed the GMSL values associated with a particular scenario. The values for each scenario in the Southwest region correspond closely to the GMSL values, which is consistent with the agreement seen between the observation-based extrapolations in 2050 for the global and regional case discussed in Section 2.3. To further understand the regional variability for a given scenario, Figure 2.5 shows the regional departure from the GMSL value for each scenario in 2100. In other words, the provided maps display the amount that needs to be added to the global value to get the associated regional value for a given scenario. The regional pattern is similar in each case. The Eastern Gulf and Western Gulf regions are consistently much higher than the global value, and the southern coast of Alaska is much lower across all scenarios. In the highest scenarios, the Northeast, Southeast, Northwest, and Southwest regions are near the global values, although there is a larger east–west separation in the lower scenarios. In these lower scenarios, the higher projections for the Northeast, when compared to the Southwest, are a result of both VLM and ocean circulation changes along the U.S. East Coast. In the higher

scenarios, the contributions from the ice sheets dominate and lead to less separation between the U.S. East and West Coasts.

Table 2.5: Scenarios of relative sea level, in meters, for eight coastal regions of the United States in 2100 and 2150 relative to a baseline of 2000. Median values are shown.

Region	Low	Intermediate-Low	Intermediate	Intermediate-High	High
Northeast					
2100	0.6	0.8	1.3	1.6	2.1
2150	0.9	1.3	2.3	2.7	3.7
Southeast					
2100	0.5	0.7	1.1	1.6	2.1
2150	0.7	1.1	2.1	2.7	3.7
Eastern Gulf					
2100	0.6	0.8	1.2	1.7	2.2
2150	0.8	1.2	2.2	2.8	3.9
Western Gulf					
2100	0.9	1.1	1.6	2.1	2.6
2150	1.3	1.7	2.8	3.4	4.5
Southwest					
2100	0.3	0.5	1.0	1.5	2.0
2150	0.4	0.8	1.9	2.6	3.7
Northwest					
2100	0.2	0.4	0.8	1.3	1.8
2150	0.3	0.7	1.6	2.3	3.3
Pacific Islands					
2100	0.4	0.6	1.1	1.7	2.3
2150	0.6	1.0	2.2	2.9	4.2
Caribbean					
2100	0.4	0.6	1.0	1.5	2.1
2150	0.5	0.9	2.0	2.6	3.7

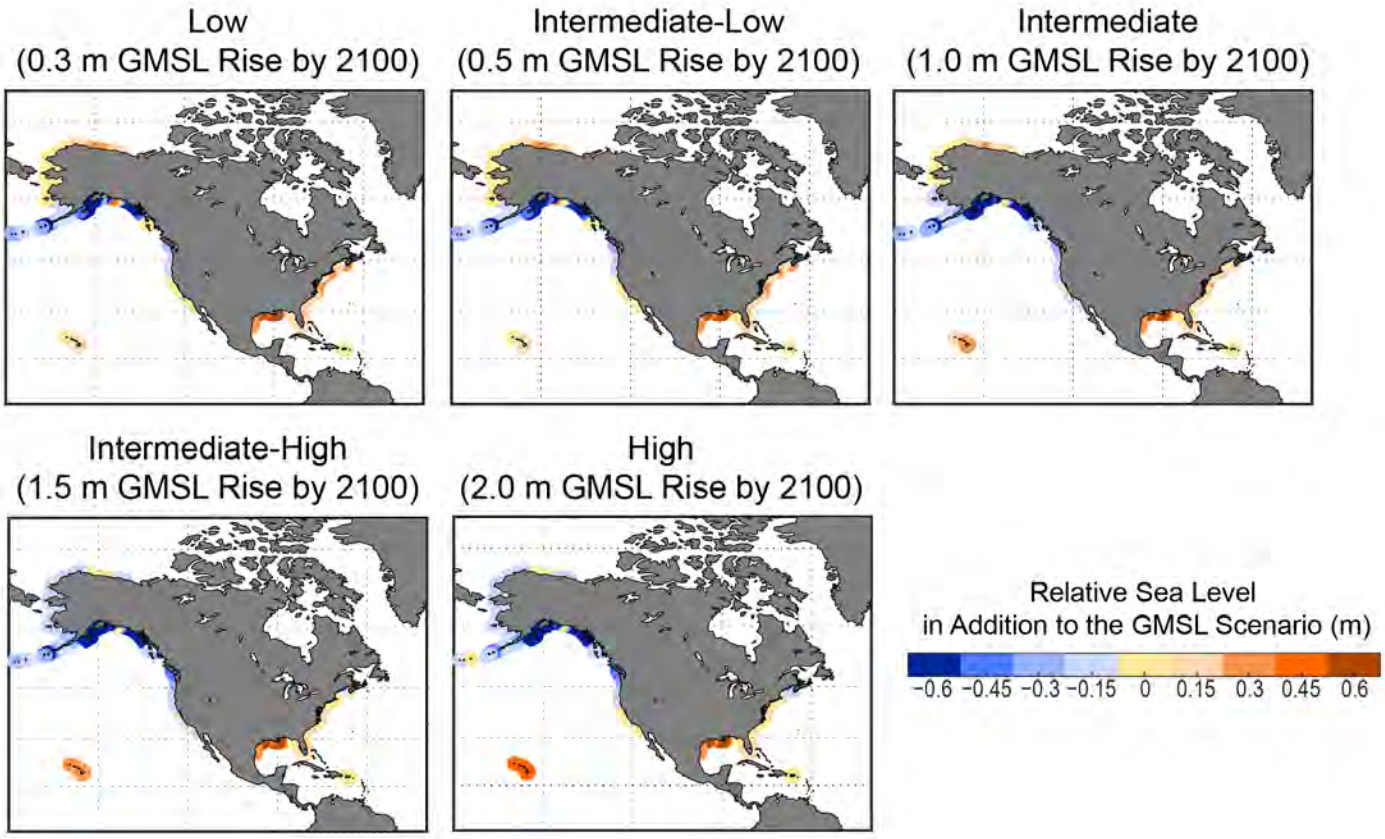

Figure 2.5: Regional deviations of relative sea level from the global mean sea level (GMSL; in meters) value for each scenario in 2100. To obtain the regional projection in 2100 for each scenario, the mapped values must be added to the GMSL value for the associated scenario.

2.5. Scenario Divergence and Tracking

In this report, for the first time, a specific focus is given to the near-term time period (2020–2050). During this window, observations can provide useful information on the trajectory of sea level rise on global and regional scales and serve as a comparison to the model-based GMSL scenarios. Prior to 2050, there is relatively small process uncertainty and little sensitivity to different emissions trajectories, and there is reduced spread between the scenarios in this report compared to Sweet et al. (2017). Connected to this reduced spread, the likely ranges of the revised GMSL scenarios presented here remain overlapping after 2050, whereas the Sweet et al. (2017) scenarios do not overlap after about 2040. In other words, in this report, the process uncertainty continues to exceed the GMSL scenario divergence past the near-term time period. Until the divergence exceeds the range for a given scenario, it will not be possible to determine when higher-end GMSL scenarios will unambiguously emerge from the potential range of the lower-end GMSL scenarios for decades to come. In this report, the time periods (or "gates") when the scenarios become separable are estimated. Different considerations for determining these gates must be made before and after the near-term time period, when the observations are most useful. It should be noted that the gates presented here are based solely on the GMSL differences between scenarios. Regionally, the timing of these gates may be different due to uncertainty in the contributing regional processes. Additionally, other lines of evidence including monitoring of individual processes or emissions trajectories could allow for distinguishing between the scenarios earlier than the gates provided here.

In Figure 2.6, the time pathways of the five GMSL scenarios from 2020 to 2100 are shown, and the gates at which the likely ranges diverge from a particular trajectory or scenario are determined. In Figure 2.6a, the divergence relative to the observation-based GMSL extrapolation is assessed. Note: the GMSL observation-based extrapolation is extended only to 2100 here for the purposes of this divergence assessment. For

the Low and High scenarios, the likely ranges separate prior to 2060, with the Intermediate-High scenario separating after 2060. On the other hand, the Intermediate-Low and Intermediate scenarios do not diverge from the extrapolated observation-based trajectory until after 2080. Consistent with the discussion in Section 2.3, if the processes driving sea level rise are assumed to remain similar for the next three decades, the Intermediate-Low and Intermediate scenarios provide useful bounds on GMSL rise for the near-term time period.

In the decades beyond 2050, however, the more uncertain processes described in Section 2.4 could become a factor and the observation-based trajectory becomes less informative. Instead of assessing the divergence relative to this trajectory, the separation gates relative to the Intermediate scenario are shown in Figure 2.6b. In this case, the Intermediate-High and High scenarios will not diverge from the Intermediate scenario until after 2070 and 2060, respectively. Only the Low scenario diverges from the Intermediate scenario prior to 2050. Although not depicted in Figure 2.6, the higher scenarios also start to overlap again after 2100; for example, GMSL rise consistent with the Intermediate scenario in 2100 (1.0 m) does not rule out GMSL rise consistent with the Intermediate-High scenario by 2150. In tying the two different gate assessments together, even though the Intermediate scenario tracks near the current observation-based trajectory, it will not be possible to statistically distinguish between the Intermediate scenario and the two higher scenarios for decades to come. This also provides important context and caution if attempting to use the observations directly to infer future sea level rise beyond the near-term time period.

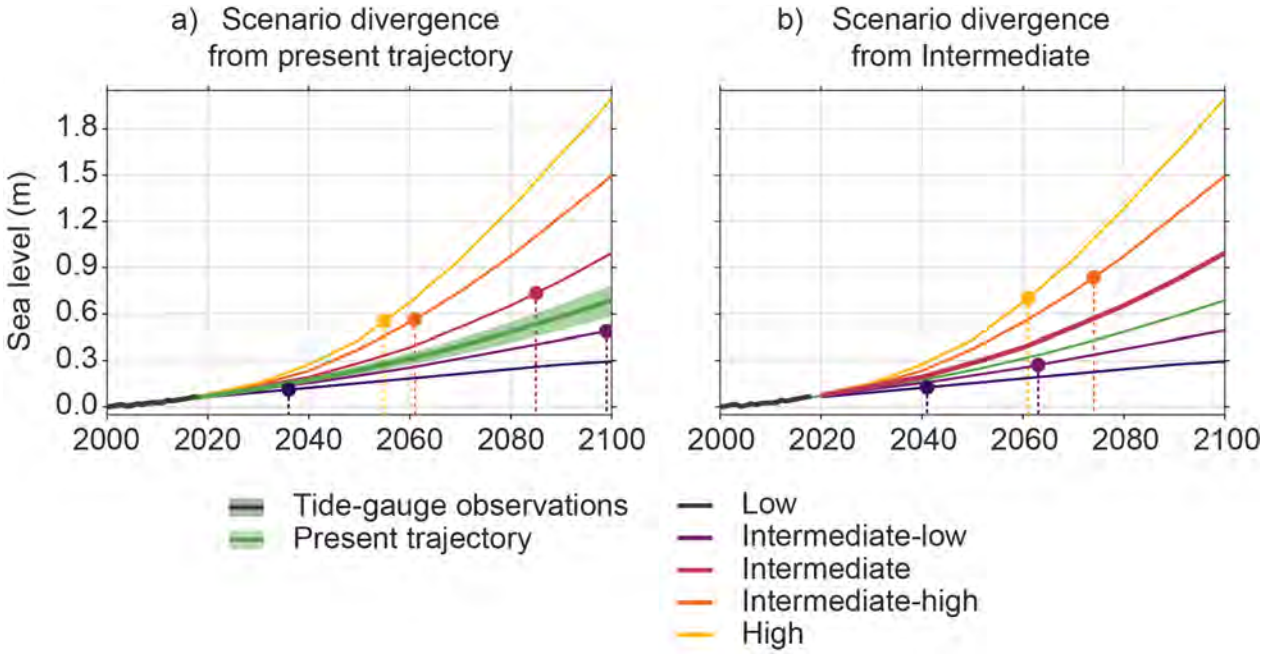

Figure 2.6: Divergence of global mean sea level (GMSL) trajectory and scenarios. The time series shows the observation-based GMSL trajectory and the five GMSL scenarios from 2000 to 2100. The dots denote where each scenario significantly (2 sigma) deviates from the a) observation-based trajectory and from the b) Intermediate scenario.

To explore this further, the proportions of the IPCC AR6 sea level projections contributing to each GMSL rise scenario are shown in Figure 2.7, with contributing emissions pathways specified. As an example interpretation of this figure, the Low scenario generally requires a low emissions pathway, while the Intermediate-Low scenario arises from low, intermediate, and high emissions pathways. Pathways consistent with the Intermediate scenario include low emissions trajectories but are mostly related to high emissions scenarios. In fact, the Intermediate, Intermediate-High, and High scenarios are all heavily driven by high emissions scenarios, and differences between these scenarios are associated predominantly with the possible role and contributions of the low-confidence ice-sheet processes described in section 2.4. The other processes that cause

future sea level change have similar contributions across these scenarios. In other words, sterodynamic sea level change is similar for the Intermediate, Intermediate-High, and High scenarios.

These estimates provide a link between the emissions trajectories in the near term and the possible scenario for GMSL rise in the long term. When coupled with the gating assessment in Figure 2.6, these estimates hold particular relevance for assessing the pathway of sea level rise and determining which long-term scenarios are then possible or even likely. As a way of connecting the elements of the report, the time period where the GMSL scenarios begin to diverge can be put in the context of the analysis done in both the near-term and long-term sections. The likely ranges of the Low and Intermediate-Low versus Intermediate scenarios separate at about 2040 and 2065, respectively. The observation-based extrapolations of global GMSL rise have a relatively narrow range out to this time horizon and can therefore play a role in determining whether a particular low-end trajectory or scenario is more or less likely to be exceeded in the coming decades. As shown in Figure 2.7, the Low scenario depends very heavily on a low emissions pathway on any time horizon. Monitoring using observations of both sea level and emissions can be useful for evaluating the likelihood of the Low scenario, both in the near term and long term.

On the other hand, the separations of the likely ranges for the Intermediate to Intermediate-High and Intermediate to High scenarios do not occur until after 2060 and 2070, respectively. The values at the end of the 21st century and beyond for these scenarios can arise under a variety of different emissions pathways, although higher scenarios are predominantly linked to higher emissions, as expected. To state it another way, the near-term trajectories discussed in Section 2.3 do not currently inform the likelihood of a given scenario occurring in 2100 or 2150. However, the observations can provide useful monitoring as the windows of separation (gates) for a different scenario approach in the future. On these global scales, process-based monitoring of the ice sheets, for example, can play an important role, as the higher scenarios (Intermediate to High) are closely linked to the potential for ice-sheet changes. Additionally, a link between the scenarios in 2100–2150, emissions pathways, and warming levels has been established here. Ongoing and continuous monitoring of both global temperatures[9] and emissions[10] will aid in determining the possible trajectory of future GMSL rise. It should be noted that while the windows provided in Figure 2.6 would be different on the national or regional level, the scenarios for a given location are still closely linked to emissions and warming, and the monitoring discussion above is still relevant.

Finally, regardless of future emissions pathways, GMSL rise will continue past 2150. The amount of "committed" rise can be assessed based on historical comparisons, modeling, and the current process-based understanding of GMSL rise. This committed rise is the amount of total sea level rise that will likely occur for a given warming level. For higher warming levels, the ranges of committed sea level are wide, but the possible values are large in magnitude. Even for a relatively low warming level of 1.5°C, the committed sea level over the next 2000 years still ranges between about 2 m and 3 m. For 2°C, the upper range increases to 6 m (IPCC, 2021a). Although the focus of this report is on the time period between 2020 and 2150, it does reinforce the "when, not if" framing provided in Section 1.

[9] https://climate.nasa.gov/vital-signs/global-temperature/

[10] https://gml.noaa.gov/ccgg/trends/

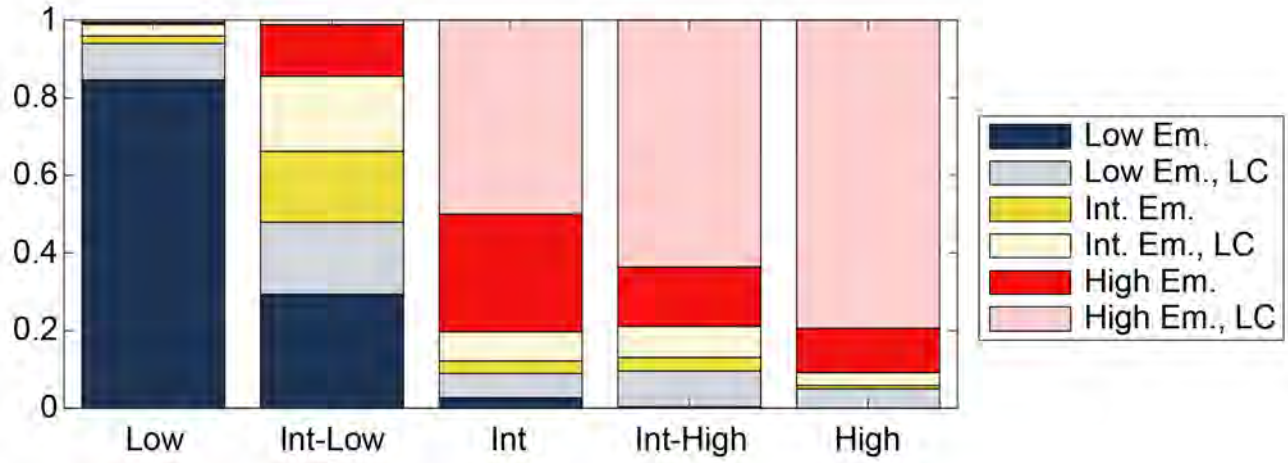

Figure 2.7: Proportions of the contributions from different IPCC AR6 sea level trajectories to each of the five global mean sea level (GMSL) rise scenarios used in this report: Low, Intermediate-Low, Intermediate, Intermediate-High, and High. The IPCC AR6 trajectories are Low Emissions; Low Emissions, LC (where LC indicates inclusion of low-confidence ice-sheet processes); Intermediate Emissions; Intermediate Emissions, LC; High Emissions; and High Emissions LC. The emissions pathways associated with the IPCC AR6 trajectories are as follows: Low Emissions = Shared Socioeconomic Pathway (SSP) 1-1.9 or SSP1-2.6; Intermediate Emissions = SSP 2-4.5; High Emissions = SSP3-7.0 or SSP5-8.5. Shifts between different GMSL rise scenarios approximately reflect the relative odds of being close to a given scenario under different emissions pathways; e.g., the Low scenario is much more plausible under a low emissions pathway, while Intermediate and higher scenarios are much more likely to be associated with high emissions pathways, as well as with low-confidence ice-sheet processes.

Section 3: Extreme Water Levels and Changing Coastal Flood Exposure

Since Sweet et al. (2017), some objectives of the Task Force have been to define and develop for the U.S. coastline 1) a set of coastal-climate flood-resilience standards and 2) a gridded set of extreme water level (EWL) probabilities that span flood frequencies with associated impacts to assess these standards. Together, these sets of information are used to describe how flood exposure within coastal floodplains are slated to change from rising sea levels (i.e., without mitigative action). Specifically for 1), we use a nationally calibrated set of the coastal water-level-impact-severity thresholds from the NOAA National Weather Service (Sweet et al., 2018), which are used in public communications. For 2), a regional frequency analysis (RFA) of tide-gauge observations is developed by adapting methods for exposure assessments within the Pacific Basin (Sweet et al., 2020b) and for the U.S. Department of Defense coastal installations worldwide[11] (Hall et al., 2016). Regional frequency analysis can provide many types of geospatial information based on limited sets of local observations, such as rainfall characteristics published by NOAA[12] (Perica et al., 2018), which are widely used in stormwater design and management within the United States. Both the RFA-based extremes and NOAA flood-threshold information are discussed below.

There are a few important notes about terminology for this section (and the report as a whole). First, "average event frequency" terminology is used throughout (except in Section 4.2 to build off of relevant papers/concepts) to describe extreme water level probabilities instead of the more traditional "return period" terminology. This is done primarily to address best practices (or avoid bad practices), which have been reviewed by the United States Corps of Engineers (USACE; USACE, 1994). Although "frequency" and "period" are related (they are reciprocals), the use of "periods" can be misconstrued; e.g., the so-called 100-year event can be easily confused or communicated (e.g., IPCC, 2021b) as an event that "occurs once per century." Such an interpretation could be assumed to imply a static and permanent water level that happens, on average, 100 years from the last event. In reality, such coastal water levels have and will continue to change with sea level rise, among other potential factors, and can occur (albeit with low probability) several times over the span of a few years. Second, although annual exceedance probability terminology is often used to describe average event frequencies (e.g., 0.1 events/year frequency expressed as the 10% annual chance event), we again stick to events/year frequency terminology, partly due to underlying method but also because events occurring more often than once a year are also being quantified and communicated (a 5 events/year frequency is poorly conveyed as a 500% annual chance event). Finally, the use of the word "occurrence" in this section means "has the probability of equaling or exceeding," as it applies to a particular water level or flood height.

3.1. Overview of Extreme Water Levels and Coastal Flooding

As sea levels continue to rise, coastal water levels—from the mean to the extreme—are growing deeper and reaching farther inland along most U.S. coastlines. Where local relative sea level (RSL) is rising, the wet–dry land delineation (i.e., mean higher high water [MHHW] tidal datum; NOAA, 2003) is encroaching landward, causing more permanent inundation and land loss (e.g., in Louisiana); affecting groundwater levels (Befus et al., 2020), stormwater systems' effectiveness (Habel et al., 2020), and water quality (McKenzie et al., 2021); and altering the intertidal zone and its ecosystems (Kirwan and Gedan, 2019). Where local RSL is falling relative to the land surface, other problems can occur, such as changes in coastal erosion processes, incision of tributaries, decreased draft for waterborne transport, decreased sedimentation in saltwater marshes, and alterations in intertidal zones and estuaries (Larsen et al., 2004; Sweeny and Becker, 2020). Especially problematic for society's coastal footprint is that the entire spectrum of flood exposure is also growing where RSL is rising, from minor high tide flooding (HTF) to more severe major flooding during storms (Sweet and Park, 2014; Fox-Kemper et al., 2021). For example, the national rate of minor HTF is accelerating and is now (circa 2020) more than double what it was in 2000 due to RSL rise (Figure 3.1), with projections suggesting

[11] https://drsl.serdp-estcp.org/

[12] https://www.weather.gov/owp/hdsc

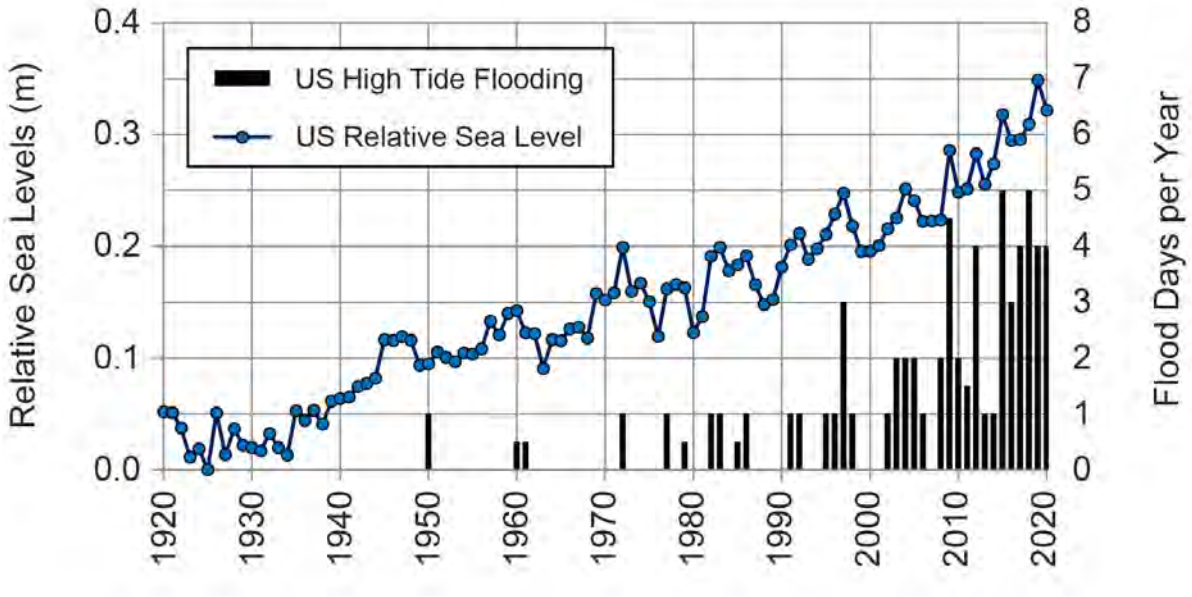

Figure 3.1: National median rate of minor high tide flooding and relative sea level, in meters, from 98 NOAA tide gauges along U.S. coastlines outside of Alaska used to monitor and track flood-frequency changes (from Sweet et al., 2021). Relative sea levels reference the lowest annual (1925) level.

a doubling of its current rate by 2030 (Sweet et al., 2018, 2021; The State of High Tide Flooding and Annual Outlook[13]; Thompson et al., 2021; Flooding Days Projection Tool[14]).

Assessments of current and future changes in minor to major HTF using RSL projections require probabilistic information about local water level variability. Specifically, they require the envelope of variability encapsulating EWLs that define the magnitude and frequency of events capable of causing a range of known or assumed impacts (Tebaldi et al., 2012; Church et al., 2013; Hall et al., 2016; USGCRP, 2017; Oppenheimer et al., 2019; Fox-Kemper et al., 2021). The basis for quantifying EWLs along U.S. coastlines originates with NOAA's tide-gauge network, which measures water level responses from multiple processes operating over a range of frequencies (Table 3.1). However, due to their general placement (e.g., in harbors), protective housings that dampen wave effects, and their multi-minute sampling rates, tide gauges typically do not measure or report values that include higher-frequency wave effects (Sweet et al., 2015; see Box 3.1). Other sources of useful tide level information for the U.S. and globally include USACE inventories (e.g., USACE MRG&P, 2017), the University of Hawaii Sea Level Center,[15] and the Global Extreme Sea Level Analysis database.[16]

Extreme water levels are often used as a proxy for impacts, such as the 0.01 events/year frequency level, better known as the "once per century" event (Oppenheimer et al., 2019), with connotations of the "flood of the century." However, such a probabilistically defined event can be both misleading about its true frequency (USACE, 1994) or might go mostly unnoticed in some locations (Sweet et al., 2020b). High tide flood heights, on the other hand, are absolute heights that are calibrated to the depth-severity impact thresholds of the NOAA National Weather Service and local emergency managers to trigger public notification of impending flood risks (NOAA, 2020). NOAA minor, moderate, and major HTF is defined as a water level reaching or exceeding about (national median values) 0.55 m, 0.85 m, and 1.20 m above current MHHW, respectively (Sweet et al., 2018). Put another way, an EWL is only a "flood" if it actually impacts the public in some manner and is not necessarily a description of a meteorological event.

[13] https://tidesandcurrents.noaa.gov/HighTideFlooding_AnnualOutlook.html

[14] https://sealevel.nasa.gov/data_tools/15

[15] https://uhslc.soest.hawaii.edu/

[16] https://www.gesla.org/

But the NOAA tide-gauge network is relatively sparse compared to the density of coastal communities, and the tide gauges have varying record lengths. From the perspective of a particular coastal community, this may result in either 1) a lack of local data (often data that are simply extrapolated from the closest NOAA tide gauge) or 2) a data record that is biased by lack of or overexposure to regionally significant rare events such as storm surges from landfalling tropical cyclones. Probabilistic assessments using atmospheric/ocean circulation models can increase spatial coverage (Vousdoukas et al., 2018), but they often perform poorly in areas with high tropical storm activity or with complex bathymetries (Muis et al., 2016). Targeted deployments of in situ sensors by communities to monitor changes in sea level, tide heights, and flood exposure (McCallum et al., 2013) can be informative but still lack the necessary longer-term regional perspective.

Table 3.1: Physical processes affecting U.S. coastal water levels and their temporal and spatial scale properties (modification of Sweet et al., 2017). Extreme water levels, which, as measured by tide gauges, generally exclude high-frequency wave effects, include processes between tsunami and ocean-basin variability and, to a lesser extent, low-frequency changes or trends associated with land ice melt/discharge, thermal expansion, and vertical land motion.

Physical Process	Spatial Scale			Temporal Scale	Potential Magnitude (yearly)
	Global	Regional	Local		
Wind Waves Effects	—	—	X	seconds to minutes	<10 m
Tsunami	—	X	X	minutes to hours	<10's of m's
Storm Surge (e.g., tropical and extra-tropical storms)	—	X	X	minutes to days	<10 m
Tides	—	X	X	hours to years	<15 m
Ocean/Atmospheric Variability (e.g., ENSO response)	—	X	X	days to years	<0.5 m
Ocean Gyre and Over-turning Variability	—	X	X	years to decades	<0.5 m
Land Ice Melt/Discharge	X	X	X	years to centuries	mm's to cm's
Thermal Expansion	X	X	X	years to centuries	mm's to cm's
Vertical Land Motion	—	X	X	minutes to centuries	mm's to m's

For the U.S., there are two primary sources of federally provided EWL probabilities. The first comes from the Federal Emergency Management Agency (FEMA, 2016b), which provides sets of regional solutions using a combination of NOAA storm-tide observations, historical high-water marks,[17] synthetic storm simulations (e.g., Nadal-Caraballo et al., 2020; ERDC Coastal Hazards System[18]), and wave effects to estimate the regulatory floodplain and its exposure to the rarest of events (e.g., 1% and 0.2% annual chance events). FEMA provides this information for national flood insurance purposes[19] but does not consider future sea levels. Another set of EWL probabilities is from NOAA's Center for Operational Oceanographic Products and Services (Zervas, 2013), which currently uses a generalized extreme value (GEV) distribution fit to annual highest water levels for tide-gauge records of >30 years).[20] The U.S. Army Corps of Engineers and their Sea Level Change Calculator[21] provide the NOAA EWL probabilities (Zervas, 2013) with several projections of future RSL to help in project planning but only for specific long-term tide-gauge locations.

A primary goal of the following subsections is to introduce a new set of EWL probabilities to support sea level rise and flood-exposure assessments and planning. The EWL set is applicable for most of the U.S. coastline and further resolves (both in physical and probability space) the EWL information currently available from

[17] https://stn.wim.usgs.gov/FEV/

[18] https://chs.erdc.dren.mil/

[19] https://www.fema.gov/flood-maps/national-flood-hazard-layer

[20] https://tidesandcurrents.noaa.gov/est/

[21] https://cwbi-app.sec.usace.army.mil/rccslc/slcc_calc.html

FEMA and NOAA; although again, the EWL data here, which are derived from tide-gauge data, generally do not include wave effects (see Table 3.1 and Figure 1.1). Section 3.2 briefly describes the RFA of NOAA tide-gauge data with pointers to the Appendix for a fuller description. In Section 3.3, data for all NOAA tide gauges with >10 years of record are used to compute EWL probabilities, and these results are compared to NOAA and FEMA datasets. Section 3.4 discusses methods on how local EWL probabilities can be 1) computed using other records, such as those of shorter duration (<10 years) from NOAA or other (user supplied) sources, and 2) estimated approximately every 500 m along the U.S. coastline based on local tide range information from NOAA models (e.g., VDatum[22]). Lastly, Section 3.5 assesses current and future flood exposure within the coastal floodplain using NOAA's height-severity categories of minor, moderate, and major HTF (Sweet et al., 2018), which broadly define water levels where U.S. infrastructure becomes impacted and are used in weather forecasting to trigger emergency responses (NOAA, 2020). Estimates of how flood exposure is projected to change by 2050 (assuming no additional adaptation or risk-deduction measures) are provided using the upper-bounding scenarios of the regional observation-based extrapolations along U.S. coastlines (see Table 2.2).

3.2. Regional Frequency Analysis of Tide-Gauge Data

Extreme water level probabilities and their 95% confidence intervals are provided at a 1-degree spacing along nearly the entire U.S. coastline (Figure 3.2). The EWL information is based on an RFA (Hosking and Wallis, 1997) of NOAA tide gauges within a 400-km radius of the center of each individual 1-degree grid and fit with a Generalized Pareto Distribution (GPD) of threshold exceedances (Coles, 2001). The RFA process not only better assesses EWL exceedance probabilities from a regional perspective as compared to a single-gauge assessment but also can supply information where no tide gauges exist. Furthermore, a GPD fit to exceedances above a high threshold as compared to a GEV fit to annual maxima uses more of the data record (e.g., two or more significant events within a particular year), not just those maxima within a certain (e.g., annual) time block. This approach, using RFA-based GPD fits, better resolves both the low- and high-frequency spectrum with output in this report ranging from 0.01 events/year to 10 events/year frequencies. Combining an RFA with GPD fits to obtain EWL probabilities is unique for U.S. coastlines, although there are other statistical methods such as the joint probability method (Baranes et al., 2020) and Bayesian hierarchical modeling (Calafat and Marcos, 2020), which may also prove useful in assessing rare event probabilities or providing information where no tide gauges exist.

[22] https://vdatum.noaa.gov/

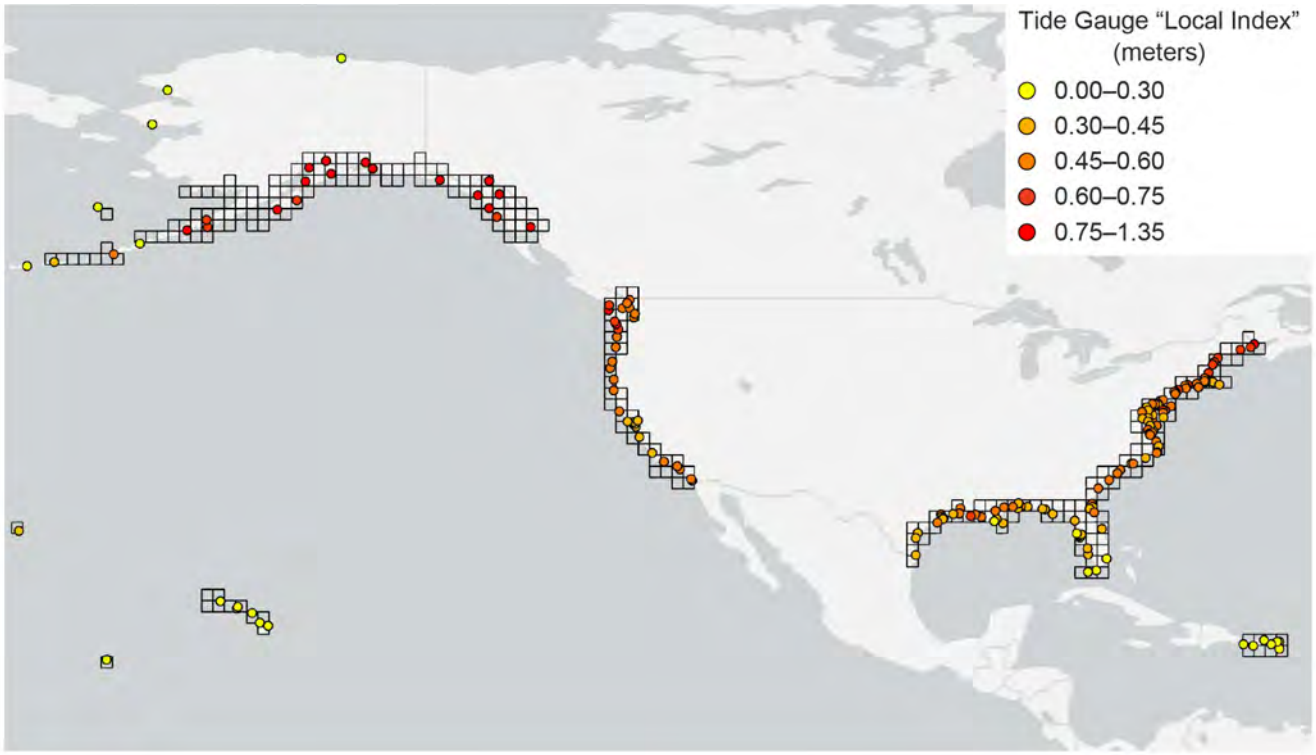

Figure 3.2: Regional Frequency Analysis 1-degree grids and local index values (u) relative to local mean higher high water tidal datum at the NOAA tide gauges used in this study.

To be useful for local decision-making, the gridded EWLs ($EWL_{gridded}$) derived by RFA need to be further localized (EWL_{local}), which is achieved via a "local index" (u) estimated at a particular tide gauge (u values are shown in Figure 3.2) or for a particular location and converted to the vertical control datum on the land surface, normally the North American Vertical Datum of 1988 (NAVD88). The following equation is used to estimate EWL_{local} probabilities (median and 95% confidence intervals):

1) $$EWL_{local} = EWL_{gridded} * u_{local} + u_{local}$$

where $EWL_{gridded}$ is the gridded EWL composed on normalized (unitless) sets of tide-gauge data, and u_{local}, referred to simply as "u," are the same value and represent the height of the 98th percentile of daily highest water levels with a 4-day filter applied and are relative to the 1983–2001 (or 5-year modified epoch; Gill et al., 2014) MHHW tidal datum. For statistical independence when quantifying the EWL probabilities, the filtering process is needed to isolate and only include the peak water level value from a particular storm or "event," rather than including multiple consecutive daily peak levels resulting from the same event (e.g., a multiday storm surge). See Section A2 for more details.

3.3. Average Event Frequencies of Extreme Water Levels

The focus of this analysis is on EWL events and their probabilities that span the frequency space associated with coastal flooding under current sea levels (Sweet et al., 2018). An example for the NOAA tide gauge at The Battery in New York City (NYC) in Figure 3.3a shows the NOAA HTF heights and probability distributions for hourly water levels and also for their daily maxima.[23] Also shown is the local index (u = 0.55 m above MHHW) computed for this tide gauge, which is used to estimate EWL_{local} from the $EWL_{gridded}$ probabilities for this location (Figure 3.3b). See Figure A2.2f for the gridded probabilities applicable for NYC. At higher frequencies, such as those associated with the height of the minor HTF level (0.56 m above MHHW), the EWL_{local} probabilities for "events" (about 4–5 events/year) are close but slightly underestimate flood frequency estimates for "days" (about 11 days/year; not shown), which are based on a multidecadal distribution

[23] https://tidesandcurrents.noaa.gov/stationhome.html?id=8518750

of daily highest water levels (shown in Figure 3.3a) used by NOAA when making projections of minor HTF (Sweet et al., 2018). This difference reflects the 4-day event filter in estimates of the EWL_{local} probabilities discussed above. A similar ratio (about 2 days per event) exists in NOAA's HTF Outlook (about 11 days/year for 2020 at NYC, which is based on an extrapolation of quadratic or linear fits to annual counts of minor HTF days (Sweet et al., 2020a). The ratio of minor HTF "events" to "days" estimated at NOAA tide gauges as a whole is further discussed later in this section. The main point is that, typically, the duration of a minor HTF "event," as in NYC and along U.S. coastlines, spans about 2 days and multiple tide cycles on average.

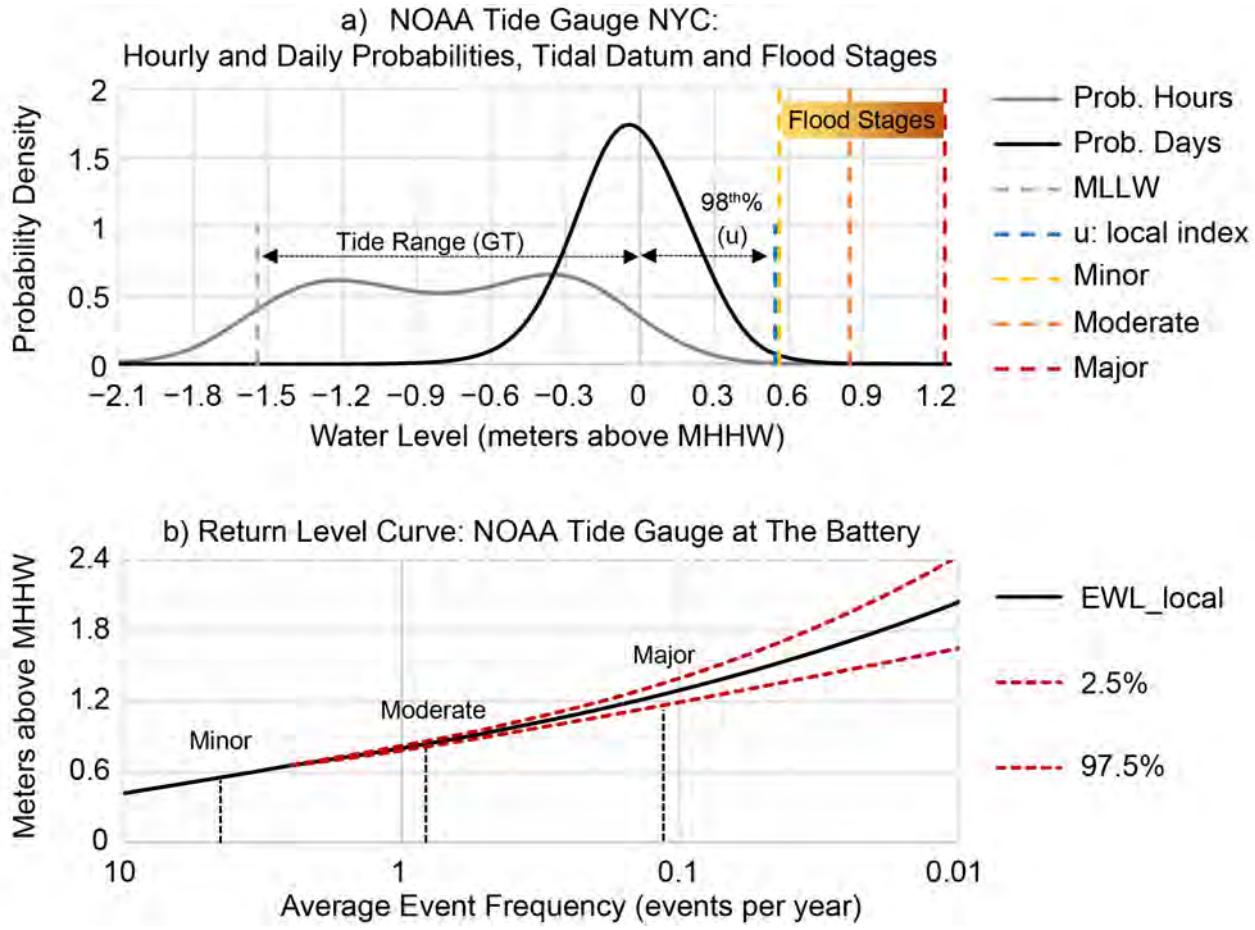

Figure 3.3: a) Empirical probability densities of hourly water levels and their daily maxima measured by the NOAA tide gauge at The Battery (New York City), as well as the tidal datums of mean lower low water (MLLW), great diurnal tide range (GT), local high tide flood (HTF) heights, and the local index (u) used to localize the RFA-gridded EWL for this location (see Figure A2.2f). All values are referenced to the mean higher high water (MHHW) tidal datum and shown in b) as a return interval curve with the 95% confidence interval (2.5% and 97.5% levels) normalized to year 2020 RSLs.

Some general patterns emerge in regional $EWLs_{local}$ with 1 event/year (Figure 3.4a) and 0.01 events/year frequencies (Figure 3.4b). Locations with higher 0.01 events/year EWL_{local} are found adjacent to wide, shallow continental coasts that are exposed to frequent tropical or extratropical storm surges, such as occur along the Eastern and Western Gulf coastal regions at 2.5 ± 1.1 m and 2.8 ± 0.8 m (median ± 1 standard deviation), respectively. In contrast, the U.S. Pacific/Hawaiian Islands and Southwest Pacific coastal regions have lower 0.01 events/year $EWLs_{local}$ due to deep, narrow continental shelves and generally calmer conditions (0.8 ± 0.1 m and 1.0 ± 0.1 m, respectively), although wave effects not inherent to the EWL probabilities are often the primary factor causing flooding, overwash, and erosion along natural landscapes in these locations (Barnard et al., 2019; see Box 3.1). In terms of the 1 event/year heights, tide ranges become influential (correlation of ~0.7 between great diurnal tide range [GT] and u across all locations), as is the case in the Northwest Pacific coastal region and the southern Alaska coasts, where the highest 1-year EWLs occur (0.8 ± 0.1 m and 1.0 ± 0.3 m, respectively) and larger tide ranges are found.

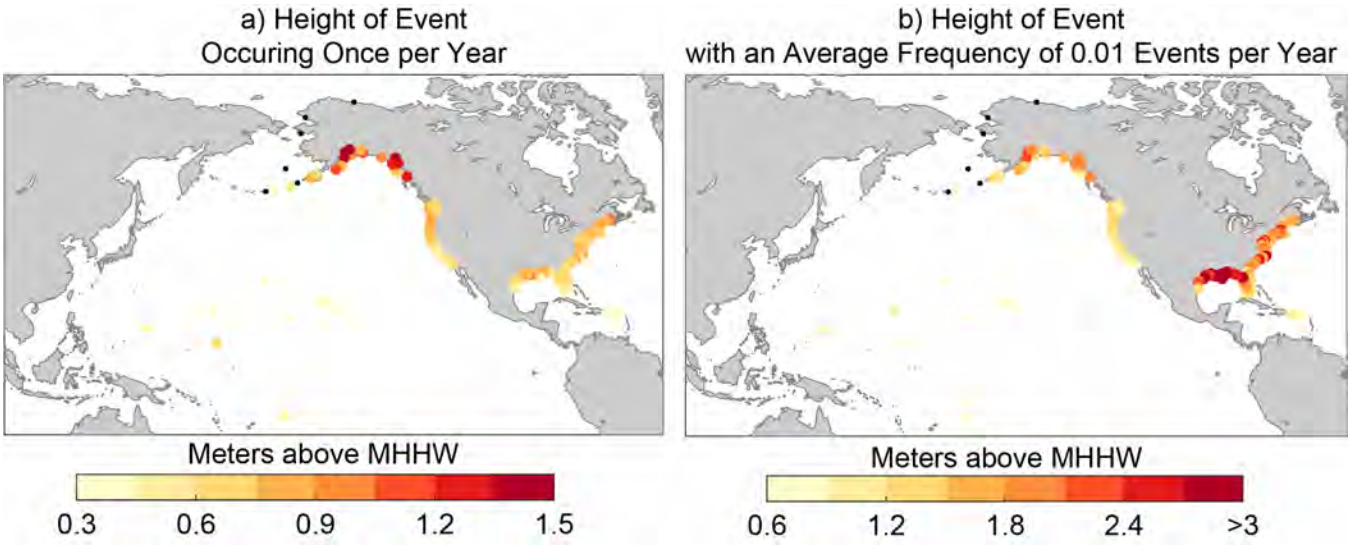

Figure 3.4: Current (circa 2020 relative sea levels) EWL_{local} that a) occur annually on average and b) have a 0.01-year average event frequency. Note: the scales in the two figures are not the same, and to be useful for decision-making, a conversion to land-based heights (e.g., NAVD88) should be made.

There are differences when comparing the RFA-based $EWLs_{local}$ from this study to current FEMA and NOAA governmental datasets. Comparisons to NOAA EWLs (Zervas, 2013) in Figure 3.5a–c show that the RFA-based 0.01, 0.1, and 0.5 events/year levels are about 6%, 9%, and 13% higher across the board based on linear regression, respectively. The bias between datasets is not unexpected, as an RFA typically results in higher EWL probabilities with narrowed confidence intervals due to the regionalization process as compared to a single-gauge analysis (Sweet et al., 2020b). Overall, there is strong correlation between datasets, although less so at the 0.01 events/year EWL_{local} ($R^2 = 0.49$) due in part to the large differences occurring along the Gulf coastlines of Alabama, Mississippi, and Louisiana, where the RFA-based 0.01 events/year EWL_{local} (~4 m above MHHW) values are substantially higher (>1 m) than the NOAA GEV estimates in a few locations.

The RFA-based EWL_{local} probabilities are also compared to the tide-gauge-equivalent "stillwater" component (tides, storm surge, and limited wave set-up, but not wave swash; see Figure 1.1) generated by FEMA and used within their regional Flood Insurance Studies[24] (Figure 3.5d–f). The FEMA EWLs vary in their construction by region, using a combination of singular and RFA tide-gauge analyses, storm-surge modeling, and synthetic tropical storm modeling (for the Northeast, Southeast, and Eastern and Western Gulf coastal regions) via a joint probability method–optimal sampling (JPM–OS) procedure (FEMA, 2016a, 2016b). The 0.01 and 0.1 events/year EWL_{local} are slightly lower (7% and 4%, respectively), with differences again noted along the Eastern and Western Gulf and Caribbean coastal regions. At the 0.5 events/year levels, both sets of EWLs are nearly the same based on linear regression. The goodness-of-fit (R^2) values are about the same as with the NOAA (2013) GEV results, although a little less at the 0.01 events/year levels—likely due to the inclusion of synthetic storm-surge modeling in the FEMA estimates, compared to the NOAA (2013) values, which are based on tide-gauge observations. Thus, it is concluded that the RFA-based EWL provides higher estimates than a single-gauge analysis (Zervas, 2013) but less than those of FEMA stillwater values at lower probabilities, since FEMA's data also include storm-surge modeling, synthetic storms, and high-water marks in addition to tide-gauge data.

[24] https://www.fema.gov/glossary/flood-insurance-study-fis

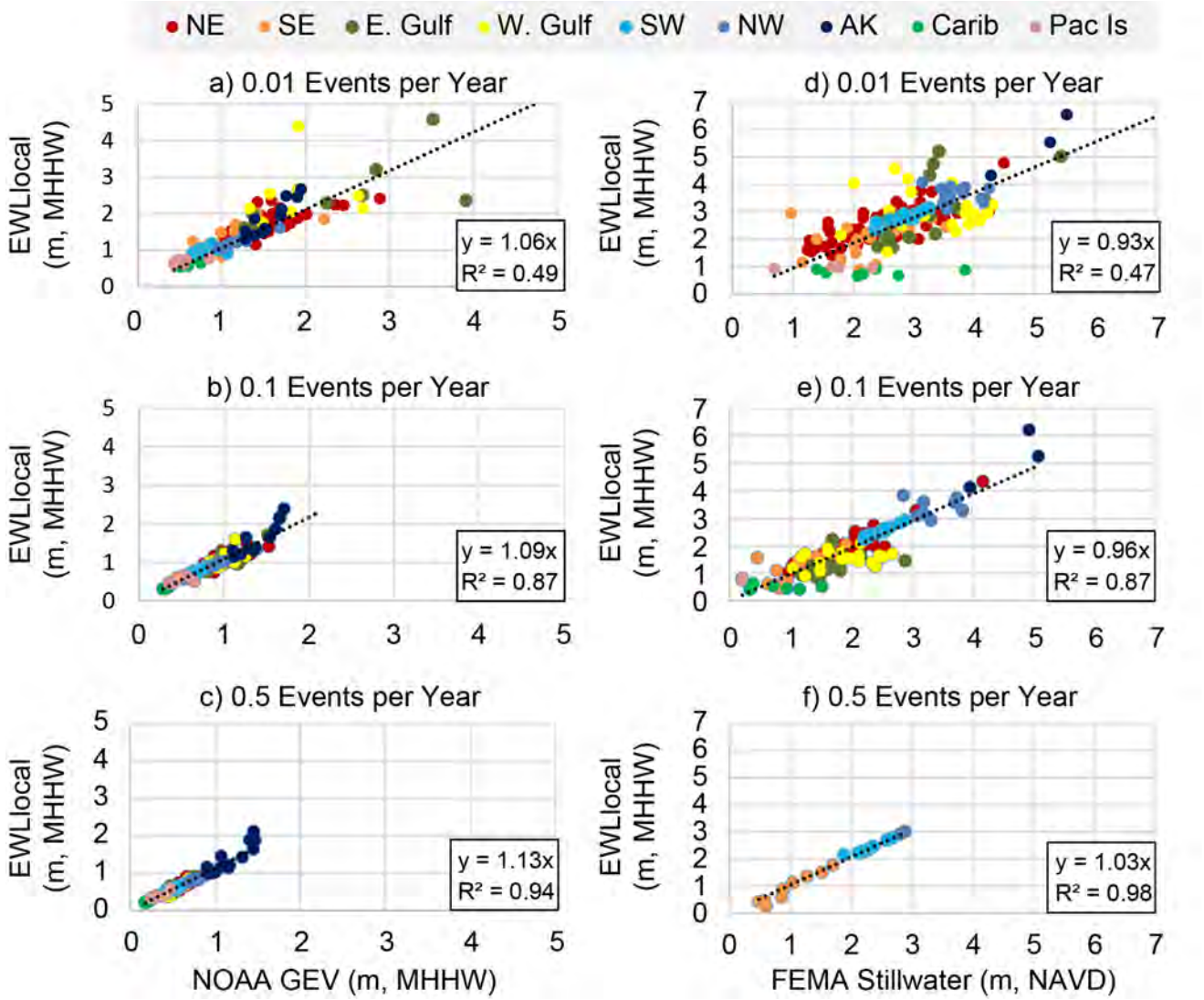

Figure 3.5: Comparison between (a–c) this study's EWL_{local} to those of NOAA (Zervas, 2013) based on a GEV fit of annual highest water levels and to (d–f) the stillwater (storm surge, tides, and wave set-up) components of FEMA used in their Flood Insurance Study at the 0.01-year, 0.1-year, and 0.5-year average event frequency levels.

3.4. Methods to Localize the Gridded Extreme Water Level Event Probabilities

There are several ways to obtain EWL_{local} from the $EWL_{gridded}$. All require a local index (u), which can be obtained from 1) a NOAA tide gauge used in this study (Figure 3.2; Table A1.3); 2) alternative sources of water level/tide-gauge data not used in this study (e.g., see Figure A2.3); or 3) tide range knowledge from measurements or models. When using short-term water level measurements (Figure A2.4), additional uncertainty, dependent on record length, is factored into the 95% confidence interval of the EWL_{local} estimate (see Equation 4 in the Appendix). This additional uncertainty relates to the fact that the local index (u) will vary from year to year akin to how RSL varies through time.[25] On a national scale (and for most regions as well; see Figure A2.4), the root mean square error (RMSE) in local index estimates is about 6–7 cm after 5 years and falls to less than 3 cm at 10 years, which is close to the standard error in tidal datum calculations themselves (see datum errors in Bodnar, 1981).

Where local water level measurements are not available, another option is to estimate a local index (u) and EWL_{local} probabilities based on an underlying relationship between local index values and tide range along U.S. coastlines. Additional uncertainty using this method will need to be factored into the results as well.

[25] https://tidesandcurrents.noaa.gov/sltrends/sltrends.html

This relationship (Figure A2.5) builds off of the findings of Sweet et al. (2020b) within the Pacific Ocean and of Merrifield et al. (2013) globally, who found a strong global correlation between the range of water level variability and average annual highest water level across the globe. Nationally, there exists a strong positive relationship (R^2 = 0.72 in Figure A2.5), although with fairly large uncertainty (RMSE of 0.11 m). But when tide range and local index values are regressed regionally, all the fits' RMSEs are less (see Figure A2.5). Across all U.S. regions, it takes about 6 years of data for the RMSE (see Figure A2.4) in local index (u) estimates to match the RMSE values based on measured tide range (see Figure A2.5). Tide range information can be obtained from NOAA Vertical Datum Transformation (VDatum).[26] Comparison of RMSEs based on multiple years of record versus tide range estimates of a local index (u) will vary by region (see Figures A2.4 and A2.5), and the lesser of the two is considered the better option in estimating an EWL_{local} for any specific location not associated with a tide-gauge location used in the study.

Here we provide an example of how to obtain EWL_{local} probabilities for a location not used in this study. The location for this example is the NOAA National Estuarine Research Reserve in Grand Bay, Mississippi (Figure 3.6a), which has a NOAA tide gauge, but the hourly record is only about 4 years long.[27]

1. The first step is to identify the specific EWL grid where the location resides, which in this case is grid number 42811 (Figure 3.6a), and obtain the $EWL_{gridded}$ probabilities.
2. Next, a local index needs to be estimated for an EWL_{local} to be computed, either by the tide-range-based method (Figure 3.6b) or using the existing short data record (Figure 3.6c) for the specific region, depending on the smaller RMSE of the two methods. The RMSE based on the tide range regression is 0.078 m (Figure 3.6b) and is less than the 0.099 m RMSE based on a 4-year water level record for this region (solving the equation shown in Figure 3.6c).
3. Using the published NOAA tide range value at this location (0.49 m) leads to an estimated local index value of 0.47 m through the regional regression (solving the equation shown in Figure 3.6b).
4. An EWL_{local} return level curve (Figure 3.6d) relative to the 1983–2001 tidal epoch is generated by substituting a local index value of 0.47 m and an RMSE of 0.078 m (with a variance of 0.078^2) into Appendix Equations 1 and 4 (see Section A2), respectively.
5. Finally, to update the curve to current conditions (circa 2020) from the midpoint of the 1983–2001 epoch (1992), 0.12 m is added to the return level curve values. The 0.12 m value represents the regional-median trend in u of 4.3 mm/year multiplied by 28 years (see Table A1.3 and Section A2.3.4 for more information). Alternatively, 0.15 m could be added instead by applying the RSL offsets from the regional observation-based extrapolations for this region (Table A1.2).

The resultant EWL_{local} probabilities estimated for Grand Bay are similar to others at nearby tide gauges that share the same 1-degree $EWL_{gridded}$ (see Figure 3.4). Less noticeable is that the 95th confidence intervals are more inflated (i.e., 0.5 m vs. 0.1 m at the 1 event/year EWL) because of the additional uncertainty from using the tide-range-based method to obtain a local index. Nationally, the spread of the 95% confidence interval at the 1 event/year EWL_{local} using a local index (u) estimated by tide range (Figure 3.6b and Figure A2.5) is 0.32 m as compared to 0.03 m when assessed across all NOAA tide gauges.

[26] https://vdatum.noaa.gov/

[27] https://tidesandcurrents.noaa.gov/stationhome.html?id=8740166

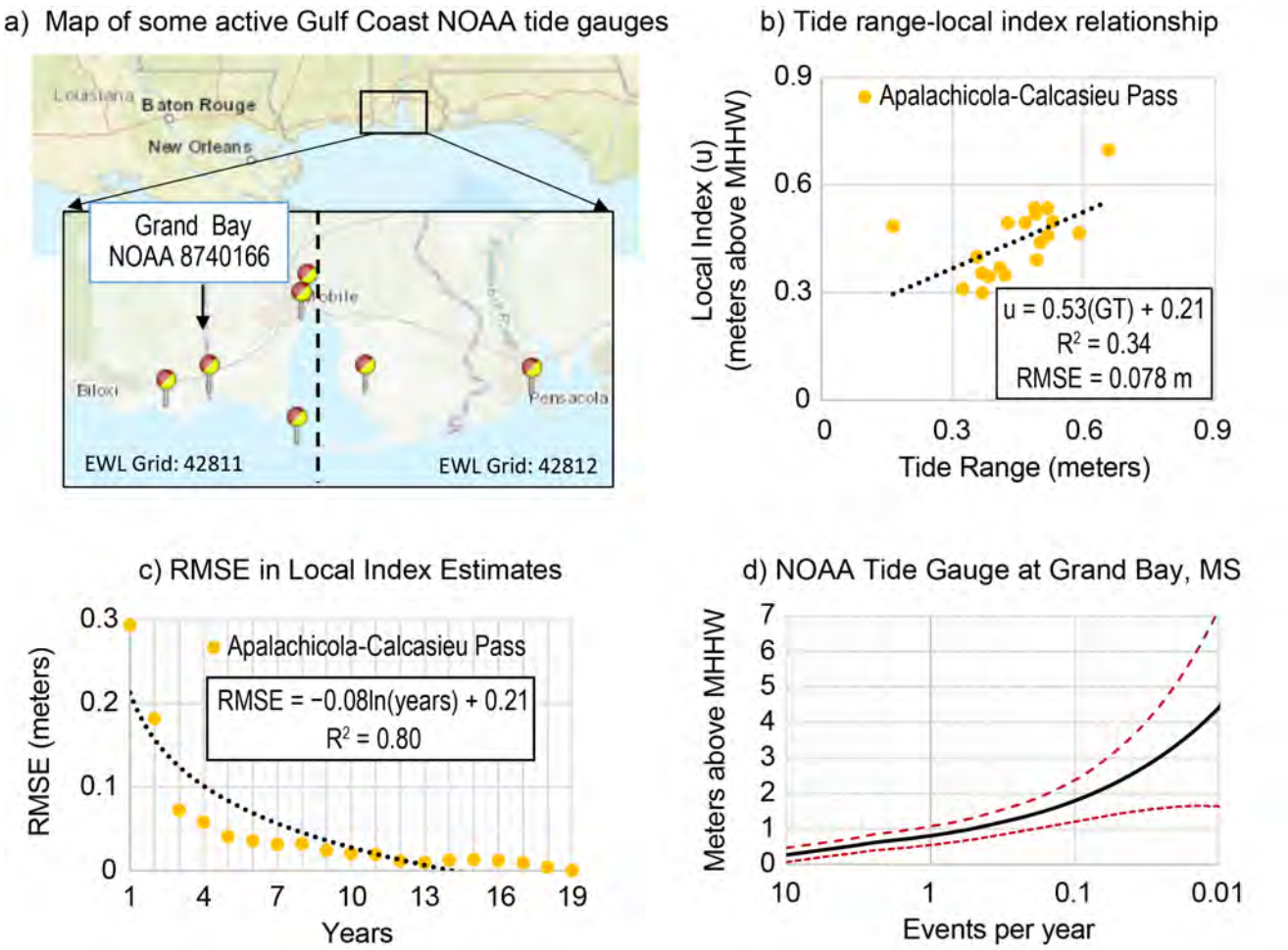

Figure 3.6: a) Map showing active NOAA tide gauges indicating Grand Bay, Mississippi, which has about 4–5 years of hourly data, b) tide range to local index (u) regression relative to the 1983–2001 tidal datum epoch with fit equation, goodness of fit (R^2), and associated root mean square error (RMSE) for the surrounding region, c) RMSE for estimates of u based on 1–19 years of consecutive data over the 2001–2019 period based on the regional tide gauges for the surrounding region; and d) a 2020 EWL_{local} return level curve for Grand Bay using a local index (u) from tide range regression. Note: to be useful for decision-making, a conversion to land-based heights (e.g., NAVD88) should be made.

3.5. The Changing Nature of Coastal Flood Exposure

To assess U.S. coastal flood exposure using the EWL_{local} probabilities, we use the nationally calibrated coastal HTF heights of NOAA (Sweet et al., 2018) and a modification of Sweet et al. (2020b) for Alaska coastlines (see Section A2.4). The NOAA HTF heights include three categories: minor, moderate, and major (national median) starting at about 0.55 m, 0.85 m, and 1.20 m, respectively (Figure A2.6), whose impacts are disruptive, typically damaging, and often destructive, respectively, under current flood defenses. NOAA provides data (e.g., Flood Frequency [MapServer][28]) and maps (Figure 3.7) in its SLR Viewer of exposure to HTF to help communities recognize potential flood exposure associated with weather–water level forecasts and for vulnerability assessments associated with sea level rise.

Currently (with EWL_{local} relative to year 2020 trend levels), minor HTF events occur (median value) about 3 times per year along U.S. coastlines and are most frequent along the Northeast, Western Gulf, and Northwest coastlines (about 4 events/year) and along the Southeast and Eastern Gulf coastlines (about 2 events/year; Figure 3.8a). A similar pattern emerges when comparing the 2020 NOAA minor HTF outlook (Sweet et al., 2020a) for the number of flood "days" at about 100 of the tide gauges (Figure 3.8b). The NOAA outlook for

[28] https://coast.noaa.gov/arcgis/rest/services/dc_slr/Flood_Frequency/MapServer

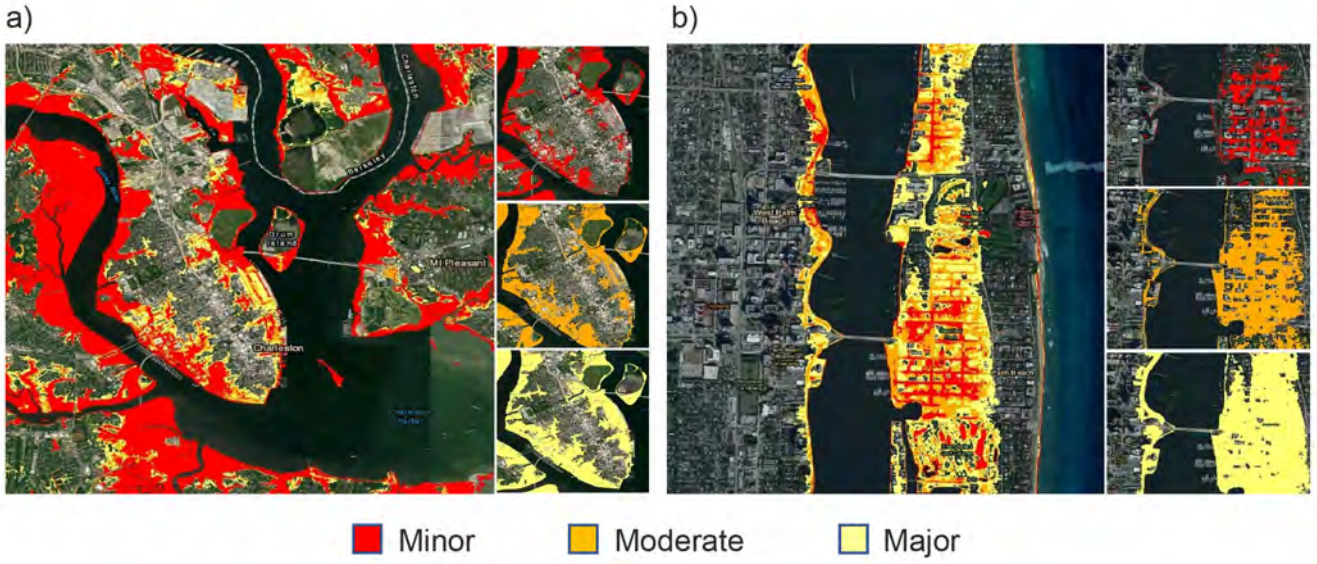

Figure 3.7: NOAA minor (red layer: land between mean higher high water [MHHW] and minor high tide flood [HTF] height above MHHW), moderate (orange layer), and major (yellow layer) HTF maps showing a regional layered map with individual layer panes to the right for a) Charleston, South Carolina, and b) West Palm Beach, Florida. MHHW for 1983–2001 is the shoreline edge. Note: to be useful for decision-making, a conversion to land-based heights (e.g., NAVD88) should be made.

minor HTF days uses extrapolations of linear and/or quadratic fits to days per year with a water level at or above the flood height. As a whole, there are about twice the number of days of minor HTF than the number of discrete events (Figure 3.8b inset), which is largely reflective of typical synoptic-scale (temporal) variability and the 4-day event filtering used in the RFA process and GPD fitting. The national (median) outlook for minor HTF in 2020 was 4–5 days, with about 8–9 days each along the Northeast and Western Gulf coastlines and 3–5 days each along the Southeast and Eastern Gulf coastlines (Sweet et al., 2020a).

Currently, moderate HTF in 2020 (Figure 3.8c) has about a 0.3 events/year frequency (median value) nationally and a similar 0.2–0.4 events/year frequency along the Southeast, Eastern Gulf, and Northwest coastlines. Moderate HTF is most likely along the Western Gulf coastlines (0.6–0.7 events/year). Major HTF (Figure 3.8d) nationally and along the Southeast coastline has about a 0.04 events/year frequency. Major HTF is most likely along the Western Gulf coastline (0.15 events/year) and along the Northeast and Eastern Gulf coastlines (0.08–0.09 events/year). For a more local perspective (see Figure 3.7), 2020 annual frequencies of minor, moderate, and major HTF in Charleston, South Carolina, and West Palm Beach, Florida, were about 2–3 events/year, 0.15–0.25 events/year, and about 0.02–0.04 events/year, respectively, based on the nearest tide gauge (see Table A1.2).

Changes in flood exposure are projected to 2050 considering no additional flood risk reduction or adaptation (e.g., via improved stormwater system functionalities) at NOAA tide gauges (Figure 3.9). The EWL_{local} probabilities are brought to 2050 levels by adding the local RSL projections initiating in year 2005 associated with the upper-bounding sea level scenario identified by the regional observation-based extrapolations (Table 2.2). Other scenarios could be used, but we opted for this particular set because it uses observational evidence—extrapolation of fits over the last 50-years (i.e., 1970–2020) to provide some level of prediction for the next 30 years. For instances where the extrapolations are the same as a particular scenario (e.g., Northeast), the adjacent (higher) scenario is used (e.g., the Intermediate is considered the upper-bounding scenario for the Northeast), which also serves to partially compensate for natural variability that is not reflected in the extrapolations.

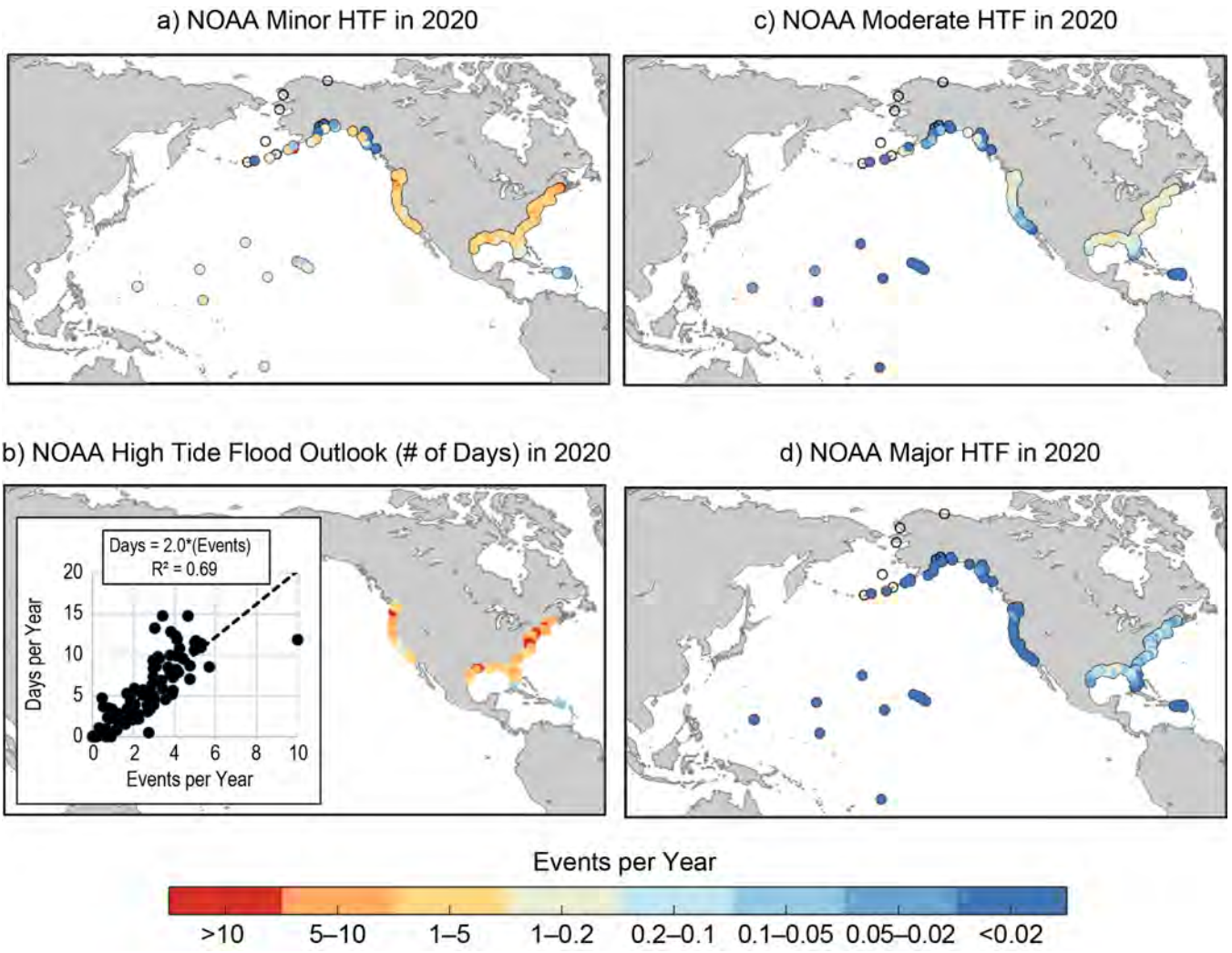

Figure 3.8: Average event frequencies in 2020 of a) minor high tide flooding (HTF); b) number of "days" (as compared to "events") of HTF estimated in NOAA's annual outlook (Sweet et al., 2021) and regression between events and days; c) average event frequencies in 2020 of moderate HTF; and d) average event frequencies in 2020 of major HTF. Flood height-severity definitions are from NOAA (Sweet et al., 2018) and, specifically for Alaska locations, from Sweet et al. (2020b).

Nationally and along all regions except the Hawaiian/Pacific Islands (about 9 events/year), the Caribbean (about 6 events/year), and Alaska (0.7 events/year) coastlines, the median event frequency in minor HTF is projected to increase to >10 events/year (Figure 3.9a). Moderate HTF (median) frequencies (Figure 3.9b) are projected by 2050 to increase nationally to about 4 events/year; >10 events/year along the Western Gulf coastline; 3–6 events/year along the Northeast, Southeast, and Eastern Gulf coastlines; about 1 event/year along the Northwest coastline; and 0.7 events/year along the Southwest coastline. Major HTF frequencies (Figure 3.9c) are projected to increase to about 0.2 events/year nationwide (median), with 1 event/year along the Western Gulf coastline, 0.5 events/year along the Northeast coastline, and 0.2–0.3 events/year along the Southeast Atlantic and Eastern Gulf coastlines. For a local perspective, the 2050 projections of annual frequencies of minor HTF in Charleston and West Palm Beach are >10 events/year, with 4–5 of those events reaching or exceeding moderate HTF and the possibility (0.1–0.2 events/year) of major HTF.

For perspective and a summary assessment by region, Table 3.2 quantifies how minor, moderate, and major HTF frequencies have changed and are projected to change considering the local RSL scenarios associated with the upper-bounding scenario of the regional observation-based extrapolations (Table 2.2) using 1990, 2020, and 2050 time slices. Nationally, minor HTF frequencies nearly tripled between 1990 and 2020, growing from about 1 to 3 events/year. They are projected to more than triple by 2050 to

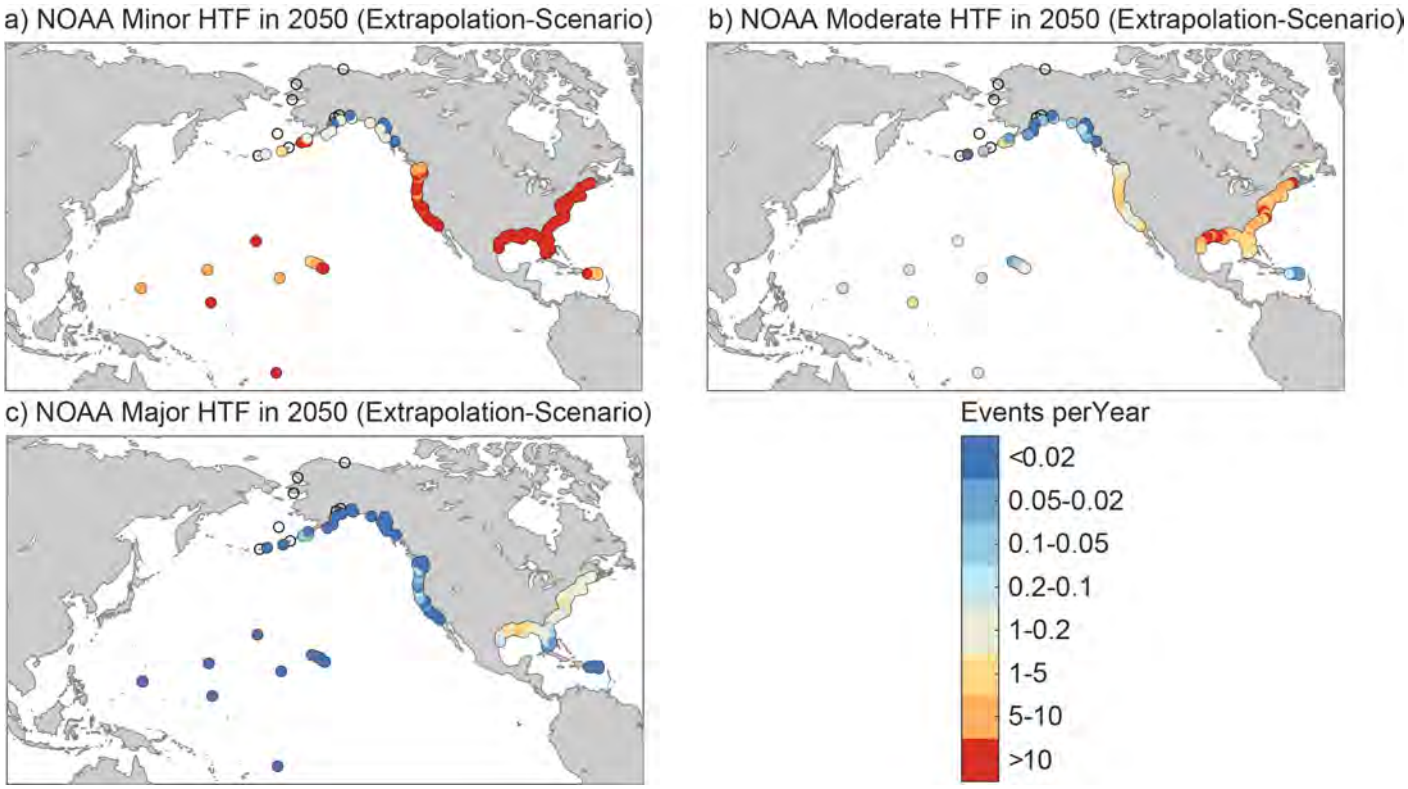

Figure 3.9: Coastal high tide flooding (HTF) frequencies projected at 2050 applying the sea level scenario that upper-bounds the regional observation-based extrapolations for NOAA a) minor, b) moderate, and c) major HTFs.

>10 events/year. Moderate HTF frequencies nationally experienced about a 50% increase (0.2 events/year growing to 0.3 events/year) from 1990 to 2020, which is slightly higher than the frequency increase in major HTF frequencies. By 2050, moderate HTF frequencies nationally are projected to increase by more than a factor of 10, with about a factor of 5 increase in major HTF frequencies. In short, assuming continuation of current trends and summarized at the national level, a flood regime shift is projected by 2050, with moderate HTF occurring a bit more frequently than minor HTF events occur today and major HTF events occurring about as frequently as moderate HTF frequencies occur today.

Table 3.2: Annual average event frequencies for NOAA-defined minor, moderate, and major HTF heights by region that were typical (median values) in 1990, under current (circa 2020) sea levels and projected to occur considering the upper-bounding scenario of the observations-based extrapolations in 2050 (see Table 2.2).

U.S. Region	1990			2020			2050		
	Minor Flood	Moderate Flood	Major Flood	Minor Flood	Moderate Flood	Major Flood	Minor Flood	Moderate Flood	Major Flood
National	1	0.2	0.03	3	0.3	0.04	>10	4	0.2
*Hawaii/Pac Is	0.06	<0.02	<0.02	0.2	<0.02	<0.02	9	0.1	<0.02
NE Atlantic	2	0.3	0.06	4	0.6	0.09	>10	6	0.4
SE Atlantic	0.9	0.1	0.03	2	0.2	0.04	>10	4	0.2
E Gulf	0.7	0.2	0.06	2	0.3	0.08	>10	3	0.3
W Gulf	1	0.3	0.1	4	0.7	0.2	>10	>10	1
SW Pacific	0.8	0.02	<0.02	1	0.04	<0.02	>10	0.7	<0.02
NW Pacific	3	0.3	<0.02	4	0.4	<0.02	>10	1	0.03
**Alaska	0.7	<0.02	<0.02	0.2	<0.02	<0.02	0.7	0.03	<0.02
US Carib	0.02	<0.02	<0.02	0.04	<0.02	<0.02	6	0.04	<0.02

*The Pacific Island locations use the same scenario assigned to the Hawaiian Islands (see Table 2.2); **Alaska locations, which as a whole could not be regionalized due to large differences in VLM, use the lower-bounding scenario per CONUS, which is the Intermediate-Low scenario (see Table 2.1). The lower-bounding scenario for Alaska is used to reflect the significant deviations below the Intermediate scenario (Figure A1.2b).

Box 3.1: Wave Contributions to Extreme Water Levels

Water level heights are a common proxy for coastal flooding (e.g., Sweet et al., 2018) and consist of a variety of components (see Figure 1.1). This report focuses primarily on projections of relative sea level (RSL) rise together with tides and storm surge contributions to extreme water levels (EWLs). However, along exposed coasts, wave-driven water levels can play a significant role in EWLs during storm events and during lesser storm conditions as exacerbated by sea level rise. Here we illustrate the relative influence of wave-driven water levels, broken down into the components of set-up and swash during extreme events across the United States, compared to tide and surge contributions.

Wave set-up is the quasi-static rise in water level at the shoreline due to breaking waves (Longuet-Higgins and Stewart, 1963). Swash is the time-varying elevation of the leading edge of wave uprush, which varies in frequency from seconds (due to incident waves) to minutes (e.g., surf beat; Guza and Thornton, 1982). Wave set-up and swash components, collectively known as wave run-up, are dependent on wave height, period, and beach slope (Stockdon et al., 2006) and are therefore controlled by local beach morphology and transient ocean conditions. To perform regional assessments of present-day or future wave-driven water level contributions, wave conditions are typically determined via global wave models forced by wind-reanalysis studies (e.g., Reguero et al., 2012) or historical/future wind fields produced by global climate models (e.g., Hemer et al., 2013).

Leveraging the global total water level assessment of Vitousek et al. (2017), which combines reanalysis models for waves, surge, and tides ("total water level" implying that all relevant components in Table 3.1 are included), we demonstrate the relative influence of waves on coastal water levels during extreme events (Figure Box 3.1). Even though the coarse resolution of this study (1° x 1° grid cells) cannot fully resolve tropical cyclones, which play a significant role in EWL events for the Southeast, Eastern and Western Gulf, Caribbean, and Hawaiian/Pacific Islands regions, this analysis demonstrates the relevance of waves in contributing to EWLs. Across the United States and its territories, using the 0.1 events/year EWL event as an example, this study estimates that wave set-up ranges from about 20–75 cm (Figure Box 3.1a) and swash from 35–125 cm (Figure Box 3.1b), together accounting for 25%–90% of EWLs (Figure Box 3.1c and based on Vistousek et al., 2017—not this study's RFA-based EWLs) for open-coast beaches (i.e., not for embayments protected from ocean waves). Wave-driven water levels (i.e., wave run-up) represent ~50% or more of the EWL contributions (again, not from this study) in areas with narrow continental shelves (reduces surge potential) and/or small tidal ranges, in particular the Hawaiian and Pacific Islands, the Caribbean, the Outer Banks (North Carolina), most of Florida, the entire U.S. West Coast, and portions of Louisiana, Texas, and Alaska. But swash oscillations only amplify coastal EWLs over short periods (i.e., seconds to minutes), whereas wave set-up represents a relatively sustained

Box 3.1 (cont.): Wave Contributions to Extreme Water Levels

contribution during storm events with about a 10% to 80% contribution to EWLs, with the highest values in the tropics (Figure Box 3.1d). As these examples indicate, when omitting wave-driven processes, coastal flood risk can be significantly underestimated for open-coast beaches, especially along U.S. island coastlines. Including wave-driven processes will be a focus of subsequent Task Force attention leading up to the Sixth National Climate Assessment (NCA6).

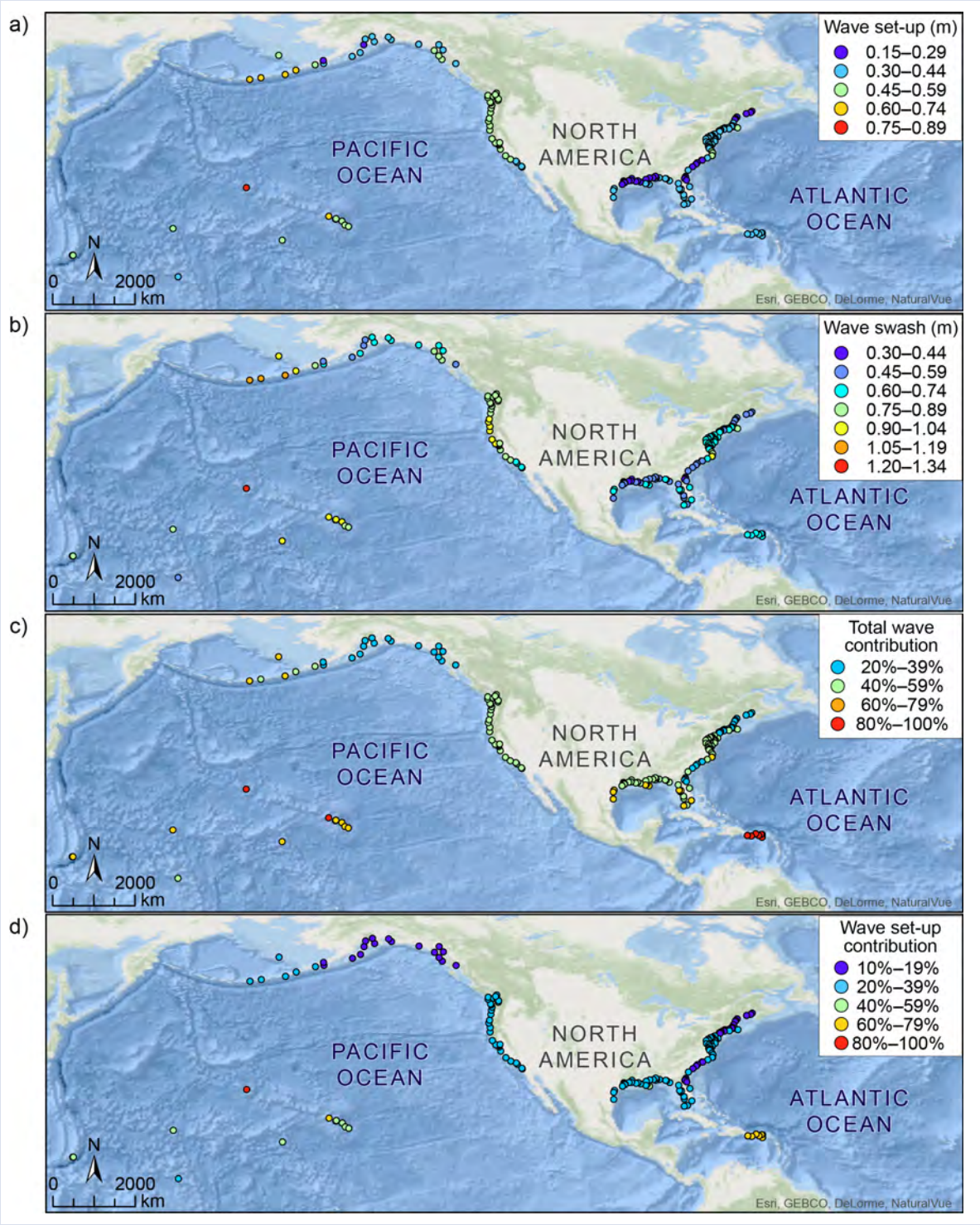

Figure Box 3.1. Water level contribution due to a) wave set-up and b) wave swash; c) percent contribution of wave-driven water levels (i.e., wave run up = wave set-up and swash) relative to all components: tide, storm surge, and waves; and d) percent contribution of wave set-up relative to the sum of tide, storm surge, and wave set-up based on model reanalysis of Vitousek et al. (2017).

Section 4: Use Cases

Below are four use cases, which use

- the (regional frequency analysis) RFA-based extreme water levels (EWLs) to map (at city scales) the annual probabilities/frequencies for the NOAA minor (disruptive), moderate (typically damaging), and major (often destructive) high tide flooding (HTF) layer classifications that are nationally calibrated to those used in weather-warning forecasting by NOAA;
- the relative sea level (RSL) projections and the RFA-based EWLs to incorporate trends (e.g., sea level rise projections) into design engineering criteria for risk management and adaptive planning;
- the RSL projections and RFA-based EWL probabilities with maps of NOAA minor, moderate, and major HTF layers to assess current and future vulnerabilities to combined storm and wastewater systems; and
- vertical land motion (VLM) rates inherent to the RSL projections are compared to rates from new satellite technologies at very high spatial resolution to showcase possibilities to monitor current rates from space and further localize the RSL projections.

The goal is to contextualize how the emerging science and this report's datasets can assist in developing products suitable for approaching (mapping, designing, or bounding) important problems in coastal risk assessment and management.

4.1. Mapping of NOAA High Tide Flood Thresholds and Flood Frequencies

High tide flooding[29] is increasingly common due to years of RSL rise. NOAA has been 1) documenting changes in minor HTF patterns since 2015, with about 100 NOAA tide gauges along the U.S. coastlines, and 2) providing a yearly coastal HTF outlook for these locations for the coming year,[30] as well as projections for the next several decades based on RSL projections from NCA4/Sweet et al., 2017. NOAA has also mapped the three HTF depth-severity (minor, moderate, and major) categories based on the relationship with tide range (Sweet et al., 2018) to show the spatial extent of associated impacts (see Figure 3.7). The minor HTF maps are provided in the NOAA SLR Viewer,[31] and all three map layers are accessible through NOAA map services.[32]

In an effort to provide better flood exposure information, NOAA is developing a product with input from partners (e.g., the Federal Emergency Management Agency [FEMA]) to assign exceedance probabilities using the RFA-based EWLs to the minor, moderate, and major HTF categories as shown for Charleston, South Carolina, and West Palm Beach, Florida (Figure 4.1). The annual event frequency shown for each NOAA HTF "zone" is assigned to the particular flood height. For example, the moderate HTF zone in Charleston is shown as the orange-brown layer in Figure 4.1a, which includes all land elevations between the minor HTF height threshold (0.570 m above mean higher high water [MHHW]; see Table A1.2) and the moderate HTF threshold (0.853 m above MHHW). This moderate HTF zone is expected to be completely (up to 0.853 m above MHHW) at risk of flooding, with an average event frequency between about 1 event/year and 0.2 events/year. A frequency range is provided to partially address the 95% confidence intervals in both the EWL statistics and the mapping data. In the case of local maps, like Charleston and West Palm Beach, the average event frequency for each NOAA HTF layer is a constant across the area shown.

These types of products can help inform the probability of higher-frequency, lower-impact events. As agencies (e.g., FEMA) start to develop products that provide more comprehensive hazard and risk information

[29] https://oceanservice.noaa.gov/facts/high-tide-flooding.html

[30] https://tidesandcurrents.noaa.gov/HighTideFlooding_AnnualOutlook.html

[31] https://coast.noaa.gov/slr/

[32] https://coast.noaa.gov/arcgis/rest/services/dc_slr/Flood_Frequency/MapServer

(e.g., graduated flood risk; see The Future of Flood Risk Data[33]), there is a need to better define and resolve the probabilities of these more frequent flood conditions. In addition, considering today's height-severity flood thresholds in the face of sea level rise (see Figure 1.3), understanding the event probabilities in this more frequent space is critical. Such information would help graduate the flood probabilities more comprehensively than FEMA's binary 1% annual chance floodplain definition and allow for a more comprehensive picture of structure-level risk.

How Can This Be Done?

The process to spatially assign probabilities again relies on a relationship to tide range (see Figure A2.5), with tide range values obtained by subtracting VDatum's MHHW and mean lower low water [MLLW] modeled tidal surfaces.[34] Using VDatum's tide range and the regional regression equations (Figure A2.5) to obtain a local index (u), the EWL return level (or rather, average event frequency) curves for the associated grid are downscaled to individual VDatum grid cells (~100 m) using Equation 1 in Section 3.2. With these downscaled curves, the HTF levels at each VDatum cell—also based on VDatum's tide range (i.e., great diurnal tide range [GT] tide datum) relationships (Sweet et al., 2018)—are intersected with the localized frequency curve (expected values) for the cell in order to determine event frequencies on a cell-by-cell basis. The average event frequencies are then associated with their respective mapped inundation footprints (3–5 m horizontal resolution). To refine the data, they were clipped to the coastal HUC (hydrologic unit code) 12 watersheds[35] that overlapped VDatum model data. This was done in order to provide a probability in watersheds that contained source VDatum data only.

The value of these data is that we can now provide not only the mapped inundation extent of each of the three HTF levels (see Figure 3.7) but also the probability, or event frequencies, for each level on high-resolution inundation data (Figure 4.1). By leveraging the relationship between the local indices (u) to GT on a regional basis, the EWL statistics can provide event frequencies for 1) most water levels or flood heights of interest and 2) most locations, even if there is not a local tide gauge nearby to assist coastal managers when planning for potential impacts to their communities. In terms of the mapped product and inherent uncertainties, it should be recognized that the VDatum model's standard error is on the order of 15 cm,[36] which is similar to that of the LIDAR elevation data.[37] The associated 95% confidence intervals from both VDatum and the LIDAR used in the mapping is then (standard error x 1.96) about 30 cm and similar to that of the EWL at the 1 event/year frequency (0.3 m median) using tide range to spatially derive EWL_{local} (Figure A2.5), although it increases to about 0.9 m at the 0.01 events/year frequency. Thus, it is recommended that these maps be used cautiously in any type of application.

Both NOAA and FEMA are currently exploring methods to further localize the $EWL_{gridded}$ probabilities, such as using NOAA short-term gauges (e.g., Section 3.4) and multidecadal hindcast modeling to develop a higher resolution set of local indices (u). FEMA is working to merge the higher-frequency portion of the EWL distributions (e.g., > 0.05 events/year) with the FEMA EWL stillwater datasets (some of which are shown in Figure 3.5). These efforts will serve, in general, to refine coastal exposure by today's standards and, specifically, minor to major HTF probabilities to better understand and communicate the Nation's coastal flood risk through products such as FEMA's National Risk Index.[38]

[33] https://www.fema.gov/fact-sheet/future-flood-risk-data-ffrd

[34] https://vdatum.noaa.gov/

[35] https://www.usgs.gov/core-science-systems/ngp/national-hydrography/watershed-boundary-dataset?qt-science_support_page_related_con=4 - qt-science_support_page_related_con

[36] https://vdatum.noaa.gov/docs/est_uncertainties.html

[37] https://www.usgs.gov/ngp-standards-and-specifications/lidar-base-specification-online

[38] https://hazards.fema.gov/nri/

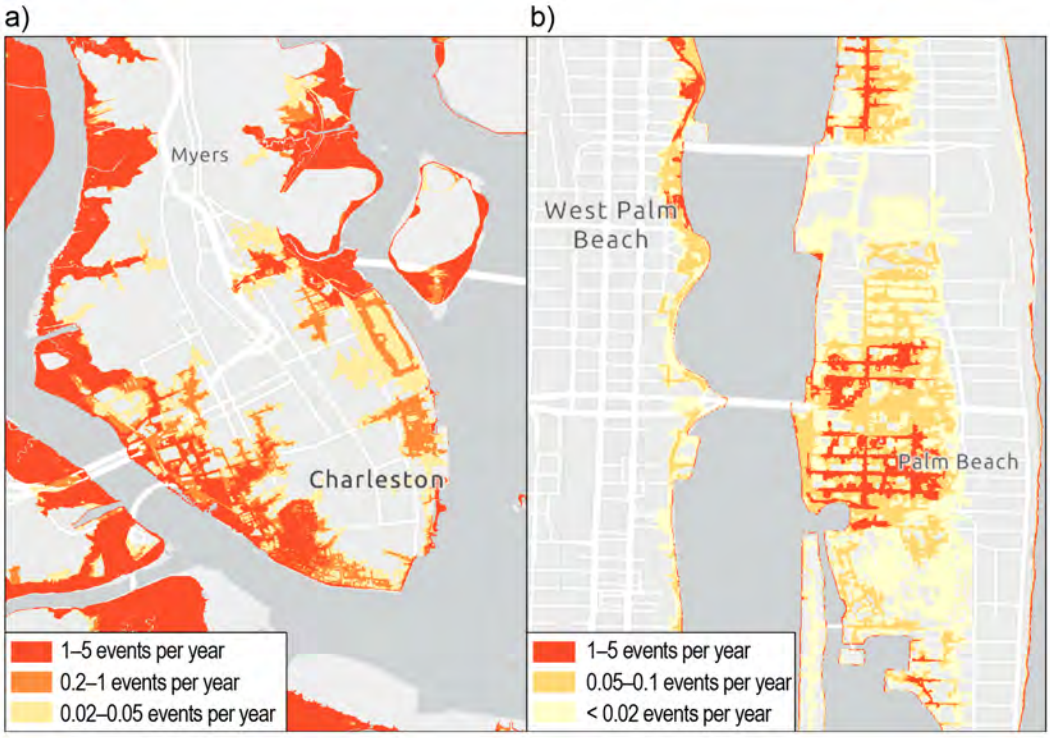

Figure 4.1: Maps of the NOAA minor, moderate, and major high tide flooding layers for a) Charleston, South Carolina, and b) West Palm Beach, Florida (as in Figure 3.7 but providing average event frequencies for each layer). Note: the shoreline on these maps is mean higher high water, but to be useful for decision-making, a conversion to land-based heights (e.g., NAVD88) should be made.

4.2. Application of Scenarios, Observation-Based Extrapolations, and Extreme Water Levels

Because future sea level rise amounts are inherently uncertain, planners and engineers who engage in addressing adaptation to future sea level rise in coastal communities often adopt a scenario approach. Based on several national and regional sea level projections (Hall, Weaver et al., 2019; Parris et al., 2012; USACE, 2014; Hall et al., 2016; Sweet et al., 2017), many communities have developed their own specific scenario sets and guidelines for how to use them. In this section, the application of the regional sea level scenarios (see Section 2) that leverage the newly developed observation-based extrapolations (see Section 2.3) and the EWL probabilities produced using the RFA (see Section 3) are illustrated for representative locations around the United States.

This use case is not meant to provide standardized planning guidance for using information on sea level rise projections; rather, it is provided as an example of applying concepts of time-varying extreme value probabilities due to sea level rise, risk reduction, and adaptive planning that may be used in practice (Salas and Obeysekera, 2014; Salas et al., 2018). One of the primary tasks in coastal infrastructure projects is to determine the design elevation (also known as the return level) of a particular structure (e.g., seawall or building) for a desired level of risk or probability. Such design problems typically require the knowledge of advanced statistical methods associated with extreme values such as those illustrated in the commonly referenced textbook by Coles (2001).

The use case is illustrated for 10 tide gauges around the United States (Figure 4.2). For reference, the upper-bounding scenarios of the observation-based extrapolations for 2050 (see Table 2.2) and the RFA-based EWL distribution parameters (Section 3) are provided in Table 4.1. The EWL probability parameters are necessary to replicate this use case, and they are specifically from a Generalized Pareto Distribution (GPD) peaks-

over-threshold approach (Coles 2001): a) the local Index, u; b) rate of exceedances above the local index, λ; c) scale, σ_{RFA}; and d) shape, ξ (see Section A2 for more details). In the examples below, the upper-bounding scenario is used (Figure 4.3a) with the corresponding return level curves for the selected tide-gauge locations (Figure 4.3b).

Figure 4.2: Tide gauges selected for the application of sea level scenarios and extreme water level methods.

Table 4.1: Tide-gauge locations, scenarios bounding the observation-based extrapolations, and the extreme value distribution Generalized Pareto Distribution (GPD) model parameters estimated using the regional frequency analysis (RFA).

Tide-gauge location details			Upper-bounding scenarios circa 2050 of the observation-based extrapolations	RFA-based GPD parameters			
NOAA ID	Location	Region	Upper Bound	Local Index u	λ	σ_{RFA}	ξ
1612340	Honolulu, HI	Haw.	Int	0.248	3.19	0.218	0.066
8518750	The Battery, NY	NE	Int	0.546	2.98	0.261	0.179
8638610	Sewells Point, VA	NE	Int	0.502	2.95	0.332	0.067
8723214	Virginia Key, FL	SE	Int-High	0.284	3.00	0.152	0.251
8726520	St. Petersburg, FL	E. Gulf	High	0.337	2.99	0.266	0.354
8729840	Pensacola, FL	E. Gulf	High	0.345	2.85	0.212	0.456
8771450	Galveston Pier 21, TX	W. Gulf	Int-High	0.366	2.75	0.289	0.340
9410660	Los Angeles, CA	SW	Int-High	0.472	3.21	0.150	−0.063
9414290	San Francisco, CA	SW	Int-High	0.375	3.15	0.211	0.038
9447130	Seattle, WA	NW	Int	0.541	3.07	0.233	−0.110

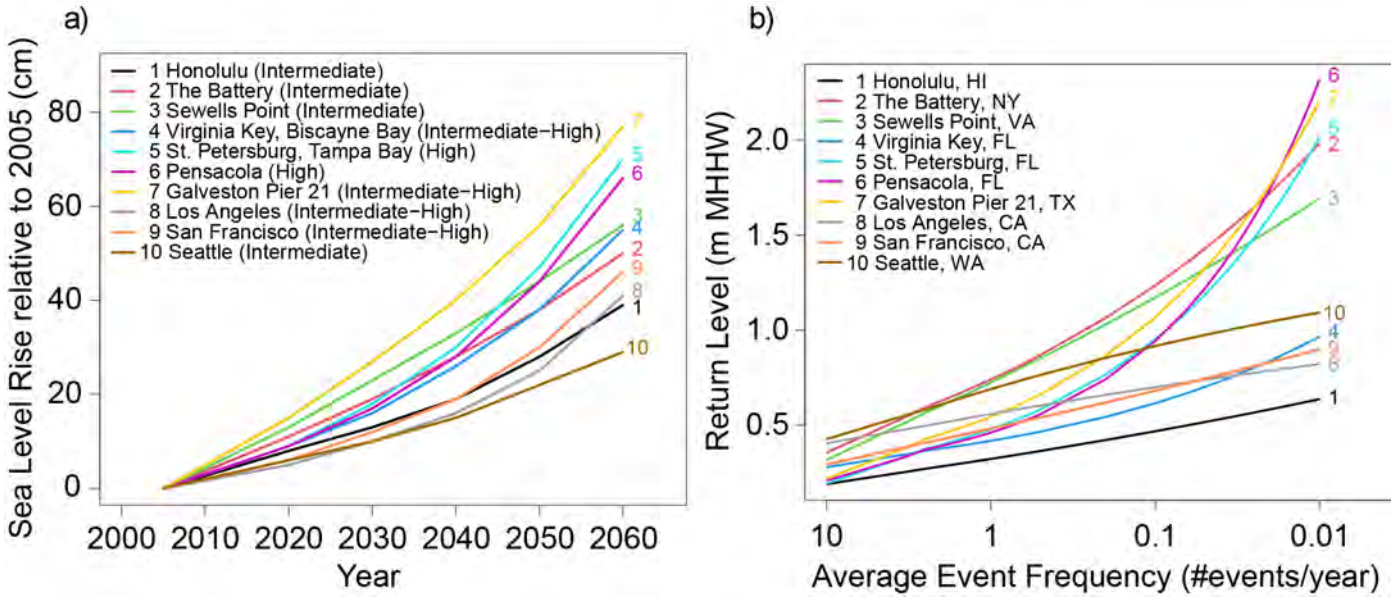

Figure 4.3: a) RSL projections for the scenarios providing the upper bound to observation-based extrapolations to 2060 for the selected tide gauges. The corresponding scenario for each tide gauge is shown in parentheses in the legend. b) RFA-based EWL (see Section 3) return level curves relative to the 1983–2001 MHHW tidal datum. Notes: (1) to be useful for decision-making, a conversion to land-based heights (e.g., geodetic datum such as NAVD88) should be made. (2) Average event frequency (x-axis label) is the reciprocal of average recurrence interval, which is also known as return period.

As shown in Figure 4.3a, 2005 is the reference year for the projection scenarios. However, the return level curves shown in Figure 4.3b are referenced to the year 2000. The return level curves are first adjusted to the year 2005 by raising the curves by an amount equivalent to the local trend in the flood index (u) from 2000 to 2005 (see Table A1.3). Alternatively, the RSL offsets (see Table A1.2) could be applied, with differences between the two insignificant to the results here.

Accounting for Time-Varying Relative Sea Level Rise

A particular scenario depicts the changes in RSL at a selected location. A common assumption is that as RSL rises, the EWLs also increase, and that must be accounted for in the changing behavior of the probability distribution of the EWLs. One approach for developing a time-varying extreme value distribution is to assume that one or more parameters (location, scale, and shape) are functions of time or some other covariate (e.g., El Niño–Southern Oscillation index; Coles, 2001; Menendez and Woodworth, 2010). When two or more parameters evolve with time (i.e., strong nonstationarity), the paradigm shifts from a "stationary" approach, typically used for planning infrastructure until recently, to one reflecting significant temporal change in the probability distribution. A common practice is to remove the trend in the extreme dataset and then to assume the distribution of the detrended extremes to be stationary. This approach is similar to the case when only the location parameter is varying with time and the other parameters are constant.

In the ensuing sections, it is assumed that only the location parameter (i.e., local index, u, in GPD) changes as a function of RSL (i.e., per the specified sea level scenario). This may be expressed as

$$F(z) = GPD(\mathrm{u}(RSL), \tilde{\sigma}, \xi)$$

where u is the RFA/GPD local index that is a function of RSL, and $\tilde{\sigma}$ and ξ are scale and shape parameters, respectively, which are assumed to be constant over time. However, this assumption does not preclude the analysis of using a higher degree of temporal variability (e.g., both u and $\tilde{\sigma}$ are functions of RSL or some other covariate). As a consequence of the above assumption, the local index u is adjusted by a magnitude δ (i.e., the regional mean sea level change from the reference year) obtained from a selected scenario.

For planning infrastructure using the scenario's RSL projections and the EWL probabilities, two approaches are illustrated: 1) recurrent flood frequency and 2) time-varying average recurrence interval (ARI; which is the reciprocal of average event frequency [AEF]) and risk.[39] While the infrastructure designs are based on a variety of factors, one or both of these approaches may be used to support that process (e.g., height of a seawall or base-flood elevation). In this use case, the term "flood" could pertain to a particular NOAA HTF level or an arbitrary probabilistic EWL level, although not necessarily to imply a meteorological (e.g., storm) event.

Designs Based on Recurrent Flood Frequency

In many U.S. coastal locations, the frequency of flooding is increasing, mostly due to rising sea levels (Sweet et al., 2021). A community may tolerate infrequent flooding initially, but at some point, when the sea level rise is significant, the flooding frequency will increase, which in turn may exceed that community's risk tolerance for flooding. Using the extreme value distributions and the sea level scenarios, it is possible to predict the time-varying change in frequency (e.g., as in Figure 3.9). In case of the GPD, the recurrent flood frequency (number of exceedances above a return level [z]) may be computed as (Buchanan et al., 2017)

$$N(z,\delta) = \lambda\left(1 + \frac{\xi(z-[u+\delta])}{\tilde{\sigma}}\right)^{\frac{-1}{\xi}} \text{ for } \xi \neq 0$$

where δ is the change in RSL (relative to the project construction year) obtained from Figure 4.3a.

In the example used here, the planning problem may be stated as follows: What should the initial return level (used for the design) be to ensure that the recurrent flood frequency is limited to a specified number of events at the end of the design life? It is now possible to lay this out graphically, as shown in Figure 4.4 for two tide gauges (Sewells Points, Virginia, and Galveston Pier 21, Texas).

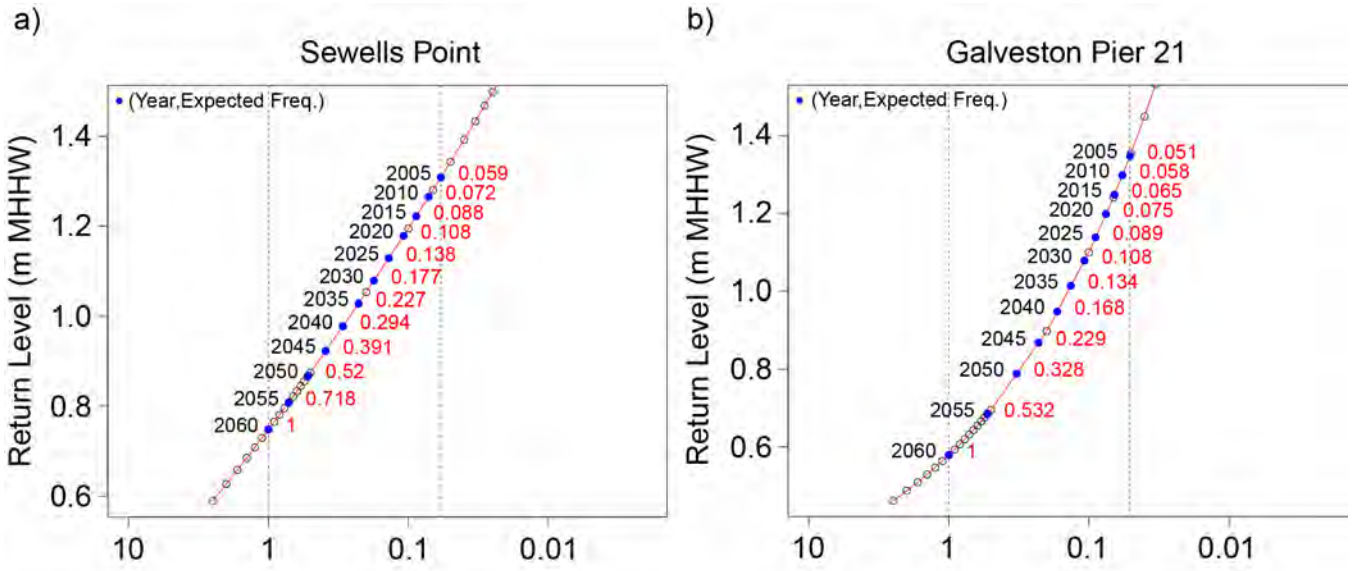

Figure 4.4: Recurrent flood frequency estimates for a) Sewells Point (Norfolk), Virginia, and b) Galveston Pier 21, Texas. For both, the relative sea level projection for the scenarios and the return level are the same as in Table 4.1. Note: to be useful for decision-making, a conversion of the return level to land-based heights (e.g., geodetic datum such as NAVD88) should be made.

In Figure 4.4, the number to the right of each point along the curve shows the recurrent flood frequency, N, corresponding to the year indicated on the left. For this example, it was assumed that by 2060, the desired value of N = 1, and the design AEF necessary for this criterion, is indicated in Figure 4.4 (AEF = 0.06 events/year for Sewells Point and AEF = 0.05 events/year for Galveston Pier 21). The corresponding design return levels are 1.31 m and 1.35 m, respectively, relative to MHHW datum. A summary of results for all 10 tide

[39] In the context of Section 4.2, risk is defined as the probability of one or more events exceeding a given height threshold over the life of a project.

gauges is shown in Table 4.2. The design average event frequency required in 2005 to meet the flood frequency criteria shows significant variability across the sites. The design return level depends on two factors: 1) the magnitude of the sea level rise from 2005 to 2060 (end of the design life); and 2) the slope (a function of the scale and shape parameters) of the return level curve (Figure 4.3b).

Table 4.2: Summary of design parameters to constrain the average event frequency, N, to 1 per year by 2060 (end-year of the design life). The 2005–2060 RSL projections are the local values associated with the scenarios providing the upper bound to the regional observation-based extrapolations shown in Table 2.2. Note: to be useful for decision-making, a conversion of the return level to land-based heights (e.g., geodetic datum such as NAVD88) should be made.

NOAA ID	Location	Relative Sea level rise (in meters from 2005 to 2060)	Return level (m above 1983–2001 MHHW) corresponding to AEF = 1 year	Return level (m above 1983–2001 MHHW) required in 2005 to ensure N = 1 by 2060	Design average event frequency (events/year) required in 2005 to achieve N = 1 by 2060
1612340	Honolulu, HI	0.39	0.33	0.72	<0.01
8518750	The Battery, NY	0.50	0.76	1.26	0.10
8638610	Sewells Point, VA	0.56	0.75	1.31	0.06
8723214	Virginia Key, FL	0.55	0.44	0.99	0.01
8726520	St. Petersburg, FL	0.70	0.49	1.19	0.05
8729840	Pensacola, FL	0.66	0.47	1.13	0.06
8771450	Galveston Pier 21, TX	0.77	0.58	1.35	0.05
9410660	Los Angeles, CA	0.41	0.57	0.98	<0.01
9414290	San Francisco, CA	0.46	0.49	0.95	<0.01
9447130	Seattle, WA	0.29	0.70	0.99	0.05

Design Based on Time-Varying Exceedance Probabilities

Average recurrence interval is used to describe EWL probabilities in the following examples to directly relate to and build off of a couple of recent, relevant focused studies on the topic. Interpretation of the results should follow guidelines of the U.S Army Corps of Engineers (USACE, 1994).

In current practice, the projects with a longer design life (> 25 years) typically use a low average event frequency (<0.1 events/year) or, equivalently, a high/long ARI (> 10 years or more). At high recurrence intervals, the peaks-over-threshold and the annual maxima recurrence intervals converge (Langbein, 1949), although not necessarily where tropical storm surges are present (Wahl et al., 2017). Revisiting the concepts of traditional ARI and risk concepts for annual maxima in time-varying frameworks has been addressed recently (e.g., Salas and Obeysekera, 2014). The application of time-varying ARI and risk concepts is illustrated by converting the GPD model to an equivalent annual maxima model, which in this case is the GEV distribution. The equivalent annual-maxima modeling approach, as used here, will also facilitate the direct application of emerging risk and recurrent interval concepts already developed for situations of time-varying extreme probabilities (Salas and Obeysekera, 2014; Salas et al., 2018; Obeysekera and Salas, 2020).

The cumulative distribution function (CDF) of the GEV model of annual maxima is expressed as

$$F(z) = exp\left\{-\left[1+\xi\left(\frac{z-\mu}{\sigma}\right)\right]^{-\frac{1}{\xi}}\right\}$$

where μ, σ, ξ are the location, scale, and shape parameters of the GEV (Coles 2001).

For computing u, the local index is further adjusted to reflect the translation of the return level curve from 2000 to the reference year (i.e., 2005). The GEV scale parameter, $\sigma = \tilde{\sigma}\lambda^{\xi}$, where the at-site scale parameter $\tilde{\sigma}$, is computed as $\tilde{\sigma} = \sigma_{RFA} * u$. For this use case, the adjusted local index is computed as $u_{adj} = u * s$ (2005–2000), where s is the trend of the local index u at the site (see Table A1.3). If desirable, other adjustment procedures may be used. Finally, the time-varying GEV model assumes that only the location parameter, μ, changes with sea level change, δ and the time varying annual extreme value distribution is given by

$$F^t(z,\delta) = exp\left\{-\left[1+\xi\left(\frac{z-(\mu+\delta)}{\sigma}\right)\right]^{-\frac{1}{\xi}}\right\}$$

The exceedance probability, p_t, which corresponds to an initial return level (z_{q0}, initial design), changes with time because of the rising RSL, δ (Figure 4.5). Consequently, the ARI is not a fixed measure but decreases with increasing sea level.

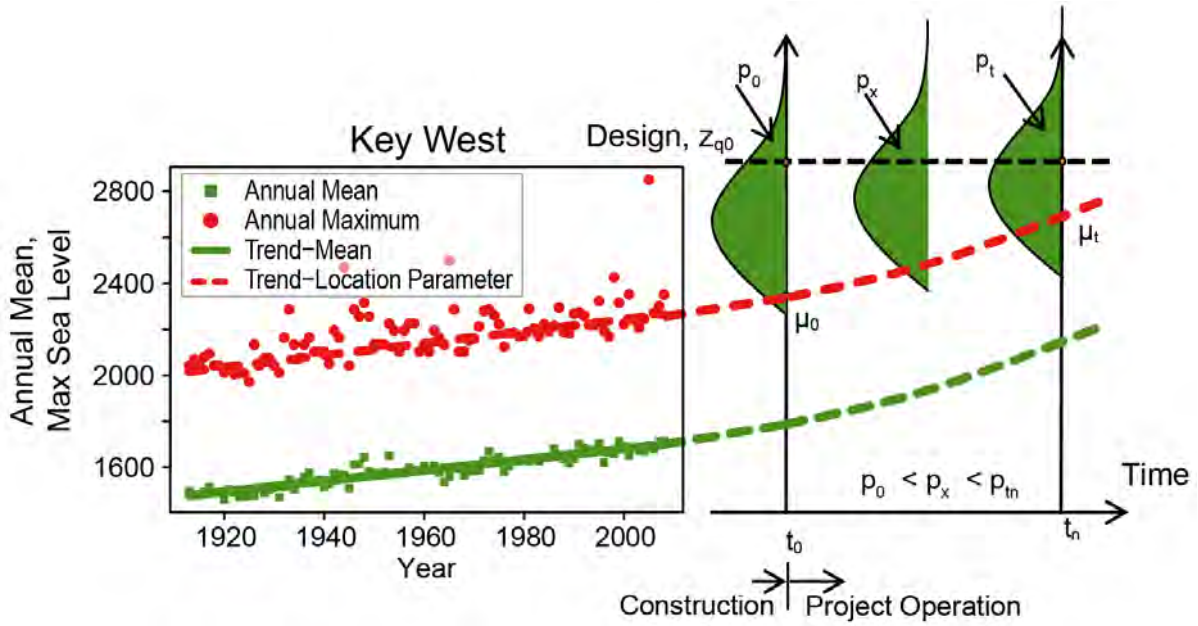

Figure 4.5: Conceptual illustration of increasing exceedance probability (hence decreasing average recurrence interval) that assumes that the location parameter is a function of the magnitude of the relative sea level rise.

The traditional concept of the ARI is the average waiting time for between two successive exceedances of the return level. Using the same definition but in a time-varying exceedance probability framework (Figure 4.5), an equivalent measure of ARI (T) may be derived as (Cooley, 2013; Salas and Obeysekera, 2014)

$$T = 1 + \sum_{x=1}^{\infty}\prod_{t=1}^{x}(1-p_t)$$

where $p_t = 1 - F^t(z, \delta)$ i is the time-varying exceedance probability. If a project is designed for a return period, $T_0[t = t_0]$, then $T < T_0$ implies that the actual recurrence interval due to rising RSL will be less.

The methods described in the preceding paragraphs are applied to the 10 tide-gauge locations shown in Figure 4.2. For illustration, it was assumed that the projection scenario for each tide gauge would continue beyond 2060. However, the methodology described above can be used with any other scenario. The derived GEV parameters for each gauge are shown in Table 4.3.

Table 4.3: The parameters of generalized extreme value computed using the peaks-over-threshold Generalized Pareto Distribution model (Coles 2001).

NOAA ID	Location	At-site scale parameter	Local index adjustment from 2000–2005 (m)	GEV location parameter	GEV scale parameter	GEV shape parameter
1612340	Honolulu, HI	0.054	0.007	0.330	0.058	0.066
8518750	The Battery, NY	0.142	0.016	0.757	0.173	0.179
8638610	Sewells Point, VA	0.167	0.023	0.748	0.179	0.067
8723214	Virginia Key, FL	0.048	0.026	0.444	0.063	0.251
8726520	St. Petersburg, FL	0.090	0.014	0.494	0.132	0.354
8729840	Pensacola, FL	0.073	0.012	0.474	0.118	0.456
8771450	Galveston Pier 21, TX	0.106	0.033	0.579	0.149	0.340
9410660	Los Angeles, CA	0.071	0.005	0.565	0.066	−0.063
9414290	San Francisco, CA	0.079	0.010	0.492	0.083	0.038
9447130	Seattle, WA	0.126	0.010	0.701	0.111	−0.110

The ARI curves, T, as a function of T_0, for all 10 tide gauge locations are shown in Figure 4.6a. This figure demonstrates that, in all cases, the actual ARI is less than the design recurrence interval. For instance, for a location near Pensacola, Florida, if a project is designed for T_0 = 100 years, the actual ARI, due to future RSL rise (Table 4.1, "Upper Bound" column), is only about 50 years. As another example, for a location near The Battery, New York City, a project may need to be designed for T_0 = 90 years if the desired ARI under its associated (Table 4.1, "Upper Bound" column) RSL rise scenario is 40 years.

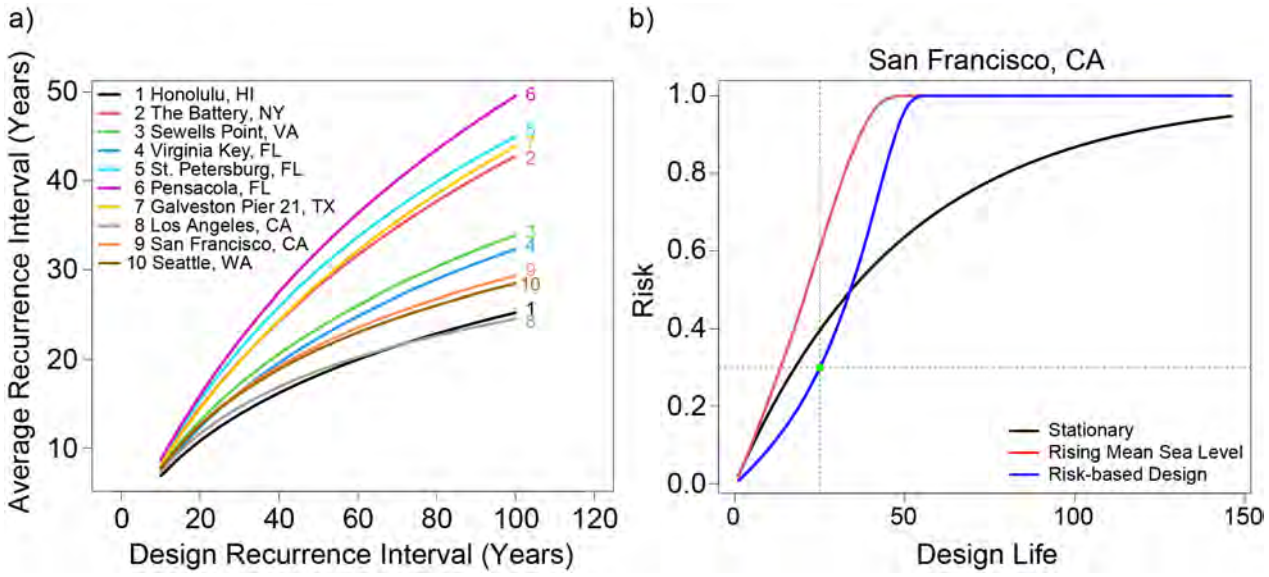

Figure 4.6: a) Average recurrence interval (due to rising RSL) curves (T versus T_0) at each tide gauge using the selected scenario's RSL projection (see Table 4.1). b) Risk curves as a function of design life: stationary (black curve), actual risk resulting from incorporating the site's RSL scenario projection (red curve), and risk curve for a specific risk (blue curve).

Risk-Based Design

Under stationary conditions, the risk (defined as the probability of one or more exceedances above the design elevation) is a function of the life of the project, n. The risk formula under stationarity is given by $R = 1 - (1 - 1/T_0)^n$. For example, there is about a (R = 0.26) 26% chance of experiencing an event with an ARI of (T_0) 100 years over the course of (n) 30 years under a non-changing (stationary statistical) environment. As the length of the design life increases, risk also increases. Under conditions of time-varying exceedance probability, p_t, the risk (R) formula is (Salas and Obeysekera, 2014)

$$R = 1 - \prod_{t=1}^{n}(1 - p_t)$$

With rising relative sea levels, p_t increases, and the risk is higher than that under stationarity. This increase in risk is illustrated for the San Francisco, California, tide gauge in Figure 4.6b when the initial design, T_0 = 50 years (the event level with a 50-year ARI). The black curve in Figure 4.6b shows the increasing risk as the design life becomes longer even under stationarity. For instance, if the design life, equals 25 years, this risk is about 0.4 (40%). However, when the local sea level rise scenario is incorporated, the risk over a given life of the project increases more rapidly, exceeding the corresponding risk under stationarity (see red curve in Figure 4.6b). In the above example, when n = 25 years, the risk will increase to about 60% due to the RSL scenario projection. Moreover, the RSL rise causes the risk to approach 100% (R = 1) when the design life is about 50 years or more. In the risk-based design approach, one can specify the tolerable risk and determine the initial design period (or return level).

One option is to design a project in such a way that the resulting increasing risk profile due to application of the scenario's RSL projection is at or below that under stationarity. While the risk-reduction approach described below is illustrated for a selected RSL scenario for the future, it can be implemented for multiple scenarios, leading to a variety of risk-reduction options depending on the future RSL scenarios. In such a broader application, a risk-based framing founded on risk tolerance may be adopted.

Considering uncertainty in the sea level rise projections, one may wish to approach the problem using concepts of dynamically adaptive planning. In the example shown in Figure 4.6b (blue curve), two parameters are specified to illustrate this concept. First, it is assumed that the project will be constructed in, for example, two or more phases. Considering such a planning assumption, phase I is 25 years long (i.e., n = 25 years), and the maximum tolerable risk during this phase is 0.3 (30%), as opposed to the 60% risk mentioned above. The blue curve shows the risk profile for such a design. This curve was computed by constraining R = 0.3 when n = 25, as shown by the green dot in Figure 4.6b. The implication of this adaptive approach is that the initial return level will need to increase from 0.84 m MHHW to 0.93 m MHHW (Table 4.4), and the corresponding initial ARI has to increase from 50 years to 125 years. In this approach, one must also assume that the project will be expanded after that initial period, and measures must be adopted to prevent locking in the design and preempting the planners from expanding it into a bigger project after the initial 25-year period. For example, the foundation design of the project may need to assume the eventual capacity expansion and allow for it in the initial design. This approach of dynamically adaptive planning is becoming increasingly popular as a way to deal with deep uncertainties associated with sea level rise.

Table 4.4 shows that with a relatively small increase in initial design elevation, the risk can be managed to a desirable level. In this example, however, the ultimate design (at the end of the full design life; e.g., 50 or 100 years) needs to be assessed to ensure that resources (e.g., land) that may be needed for the build-out are considered.

Table 4.4: Results of the risk-based design for all tide gauges shown in Figure 4.2. Average recurrence interval (ARI) is listed and is the reciprocal of average event frequency. Values in the last column have been rounded to the closest 5-year interval. Note: to be useful for decision-making, a conversion of the return level to land-based heights (e.g., geodetic datum such as NAVD88) should be made.

NOAA ID	Location	Design return level for T_0 = 50 years (m above MHHW)	Design return level to constrain risk to 30% over a 25-year period (m MHHW)	Average recurrence interval (ARI) of the design to constrain probability (risk) to 30% over a 25-year period
1612340	Honolulu, HI	0.59	0.69	>100
8518750	The Battery, NY	1.74	1.95	90
8638610	Sewells Point, VA	1.55	1.75	>100
8723214	Virginia Key, FL	0.78	1.00	>100
8726520	St. Petersburg, FL	1.61	1.88	80
8729840	Pensacola, FL	1.75	2.09	75
8771450	Galveston Pier 21, TX	1.79	2.13	85
9410660	Los Angeles, CA	0.79	0.86	>100
9414290	San Francisco, CA	0.84	0.93	>100
9447130	Seattle, WA	1.05	1.13	>100

4.3. Growing Risk to Combined Storm and Wastewater Systems from Sea Level Rise

Sea level rise is causing HTF to become more severe—more frequent, deeper, and more widespread—in terms of its impacts (Sweet et al., 2021). Coastal areas that are not exposed to HTF now may become so in the coming decades. As the footprint of flooding expands, water from adjacent estuaries and bays will flood into communities and encounter previously unaffected urban infrastructure.

Many places already see backflow from tidal waters through stormwater pipes that spill out of catch basins into neighborhood streets. Cities with combined sewer systems often have backflow preventers on their vulnerable outfall pipes (EPA, 1995a, 1995b). However, combined sewers will be open to inflow from surface flooding. If floodwater in the streets encounters a catch basin that connects to a combined sewer system, then high tide waters will enter the sewer. At best, the tide waters will be on their way to the sewage treatment plant; at worst, a combined sewer outflow would be triggered if the sewer pipes cannot handle the volume of water.

While Camden, New Jersey, has taken action to prevent runoff from entering its system,[40] tidal inflow is a novel problem. Identification of risks like this can provide lead time to take adaptation actions. Still, in some combined sewer communities, such as Camden, the onset of risk can arrive well before midcentury. Mapping shows that minor HTF at a height of 0.58 m above current MHHW tidal datum (Table A1.3) begins to have a footprint in Camden neighborhoods served by combined sewers (red shade in Figure 4.7, spanning from MHHW to 0.58 m [1.9 feet] above MHHW; locations are provided by the New Jersey Department of Environmental Protection[41]). By the time the tide reaches the moderate (0.86 m above MHHW) and major

[40] https://www.epa.gov/arc-x/camden-new-jersey-uses-green-infrastructure-manage-stormwater

[41] https://njdep.maps.arcgis.com/apps/Viewer/index.html?appid=70dd49de342949ca933e840d0c530fc7

(1.25 m above MHHW) HTF levels, the extent of flooding increases dramatically, and many intersections will be flooded.

The Camden region currently (circa 2020) experiences

- about 2 events/year (or about 4 days/year per Figure 3.8b) of minor HTF;
- 0.2 events/year of moderate HTF; and
- 0.03 events/year of major HTF,

based on the EWL_{local} directly across the Delaware River at the NOAA tide gauge in Philadelphia. The EWL-based probabilities support actual observations in 2020, when the Camden/Philadelphia region experienced 4 days of minor HTF, with 4–8 days projected to occur in 2021 (Sweet et al., 2021).

Considering the Intermediate scenario, which is the upper-bounding scenario for this region's RSL observation-based extrapolations (see Table 2.2), a rise of 0.19 m by 2030 (measured since 2005) is projected to result in

- 5–10 events/year (on the order of 10–20 days/year) of minor HTF,
- 0.6 events/year of moderate HTF, and
- 0.07 events/year of major HTF.

By 2050, a 0.38 m RSL rise is projected (above 2005 levels) for this area, resulting in

- >10 events/year (perhaps >20 days/year) of minor HTF,
- about 3 events/year (6 days/year) of moderate HTF, and
- 0.3 events/year of major HTF.

So, within about the next 30 years (by 2050), a surface flood regime shift with subsurface impacts is projected to occur in Camden, considering current RSL rise trajectories. By then, moderate and major HTF (flooding upwards of 0.9 m and 1.2 m above MHHW, respectively) is projected to occur with similar frequencies/probabilities as minor (about 0.6 m above MHHW) and moderate HTF occur today. With nearly 4 high tides per event (1 event lasts about 2 days; 2 high tides occur almost every day), this implies that by 2050, upwards of 80 tides per year or more at the minor HTF level are projected, with about 12 of those tides per year exceeding the moderate HTF level and a 0.3 events/year frequency of major HTF flooding. Any time street intersections are underwater, tidal waters could flow down catch basins into the combined system (Figure 4.7). Beyond 2050, HTF frequency, depth, and extent will continue to grow. It is unclear how this increased flood frequency will affect the combined sewer system's functionality and surrounding water quality.

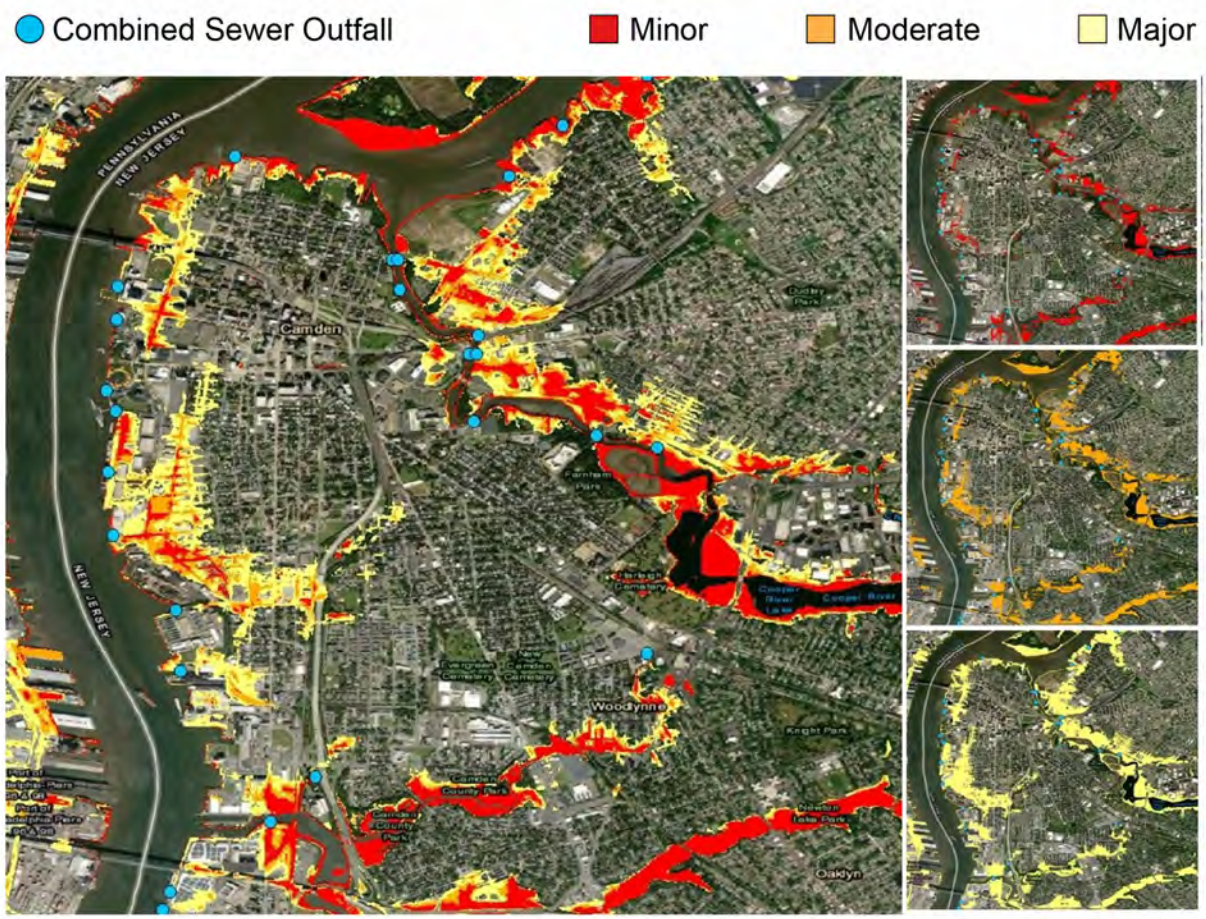

Figure 4.7: Location of combined stormwater and sewer system outfalls that are likely draining regions exposed to HTF within the Camden, New Jersey, region, with the minor (red: MHHW to 0.58 m [1.9 feet] above MHHW), moderate (orange: MHHW to 0.86 m [2.8 feet] above MHHW), and major (yellow: MHHW to 1.25 m [4.1 feet] above MHHW) HTF layers stacked in the enlarged map and individual layers mapped to the right. Note: heights are relative to the 1983–2001 tidal epoch, and to be useful for decision-making, a conversion to land-based heights (e.g., NAVD88) should be made.

4.4: Use of InSAR Technology for Determining Regional Vertical Land Motion and Its Suitability for Computing Long-Term Sea Level Rise Projections

Vertical land motion is an important component of RSL rise, leading to changes in the height of the ocean relative to land. Vertical land motion is not a singular phenomenon but instead results from various processes that display different patterns in space and time. These patterns have different impacts from place to place, especially in coastal settings where many of them operate at the same time and can serve to either increase RSL (subsidence) or decrease RSL (uplift). For much of the coastal United States, subsidence is driven on local scales by both natural processes, such as compaction of river sediments, and unnatural, human-caused reasons, such as groundwater and fossil fuel withdrawal; on larger scales, subsidence is driven by glacial isostatic adjustment (GIA). On the other hand, in some regions, such as southern Alaska, GIA leads to high rates of uplift in coastal regions. For example, Grand Isle, Louisiana, has experienced more than 0.9 m (3 feet) of RSL rise, whereas Juneau, Alaska, has experienced more than 1.2 m (4 feet) of RSL fall based on a 100-year historical linear rate value,[42] in large part due to VLM. For perspective, the national median RSL rise along U.S. coastlines during this 100-year period was about 0.25–0.30 m (see Figure 1.2b).

[42] https://tidesandcurrents.noaa.gov/sltrends/

Accurate future projections of VLM require an understanding of and accounting for the underlying processes and the time and space scales on which they vary. In this report, VLM projections are based in part on analysis of past observations. Vertical land motion rates are estimated at tide-gauge locations as well as at 1-degree grids using a statistical model of tide-gauge observations (Kopp et al., 2014; Sweet et al., 2017; Fox-Kemper et al., 2021; Garner et al., 2021). The model assesses RSL change across the global tide-gauge network[43] with data through about 2019 and separates the tide-gauge observations into 3 modes: 1) a global rise signal (Dangendorf et al., 2019), 2) a long-term linear—but regionally varying—rate, and 3) local effects that vary in time and by region. It is the second mode that defines this report's linear VLM rates, which have been incorporated into the RSL projections for each GMSL rise scenario. These rates are assumed to be linear over the past record and to persist linearly into the future over the length of the projected record. Assumed persistence may not necessarily be valid over the long term (e.g., if groundwater pumping ceases) but may be necessary due to a lack of data. As shown in Figure 4.8a, high rates of subsidence are estimated along the entire Gulf Coast, and moderate rates of subsidence are assessed along the entire East Coast. On the other hand, high rates of uplift are estimated for the southern coast of Alaska.

Over the past couple of decades, GPS stations have provided estimates of VLM in coastal areas across the United States. These GPS-based VLM estimates provide a comparison to the VLM rates in this report, albeit with a couple of caveats. First, the record lengths over which the GPS-based estimates are computed are significantly shorter than the tide-gauge data records used to infer the VLM rates in this report. Second, many tide-gauge locations do not have a co-located GPS station. While it is not possible to extend the record lengths of the available GPS measurements, the second challenge has been addressed using the GPS-imaging technique discussed in Hammond et al. (2021), which leverages the GPS network in coastal areas of the United States to generate VLM estimates at all tide-gauge locations (Figure 4.8b). Note that negative values of VLM reflect subsidence while positive values reflect uplift. To determine the VLM contribution to RSL at the coast, the negative and positive direction would be reversed. Broadly, the GPS-based estimates are consistent with the VLM estimates contained in this report. However, when subtracting the VLM rates in this report from the GPS-derived rates, differences become apparent (Figure 4.8c). The largest differences are found along the Southern Alaska coastlines, where rates of uplift are very large, and along the entire Gulf Coast, where subsidence rates are large. The rates are further compared in Figure 4.8d, which again reflects general agreement between the two sets of estimates, although at roughly 75% of the gauges, the tide-gauge-based VLM estimate in this report is greater (less negative in the case of subsidence) than that from GPS. In other words, there are generally higher rates of subsidence indicated in the GPS rates when compared to the VLM estimates in this report.

This comparison with the GPS is not intended to be an assessment of the accuracy of VLM rates and associated projections included in this report. Instead, it highlights some of the challenges associated with both estimating VLM rates at the coast and then projecting these into the future, particularly away from the tide-gauge and GPS stations. The spatial variability and local drivers of VLM are clear in Figure 4.8, and extending the tide-gauge-centered estimates to fill in spatial gaps either through the projection framework in this report or with GPS imaging is challenging to validate, particularly as these methods are not intended to capture VLM varying on small spatial scales. An opportunity is provided, however, by new technologies using satellite-based advanced Interferometric Synthetic Aperture Radar (InSAR) analysis, which can provide higher spatial resolution measurements of VLM rates. Calibrated to land GPS station estimates, measurements of land elevations over time by InSAR are producing VLM rates for large swaths or the U.S. coastal plain (e.g., Bekaert et al., 2017; Buzzanga et al., 2020; Bekaert et al., 2019; all InSAR VLM estimates are publicly available through references). Having a higher-resolution assessment of VLM rates can in turn help communities understand where VLM is now occurring at very fine scales (e.g., street block level) and help make informed decisions of how continued VLM will contribute to future RSL projections. Furthermore, InSAR provides an

[43] https://www.psmsl.org/data/

additional component to the coastal VLM observing network. Integrated assessments across tide gauges, GPS, and InSAR are likely to be most useful for inferring VLM rates and projecting these rates forward at the spatial scales key to coastal communities. Following is a case study of how the InSAR VLM connects to this VLM-observing network. In general, as there is the possibility of using a user-defined VLM rate within the RSL projections, we examine other sources of VLM that may offer options.

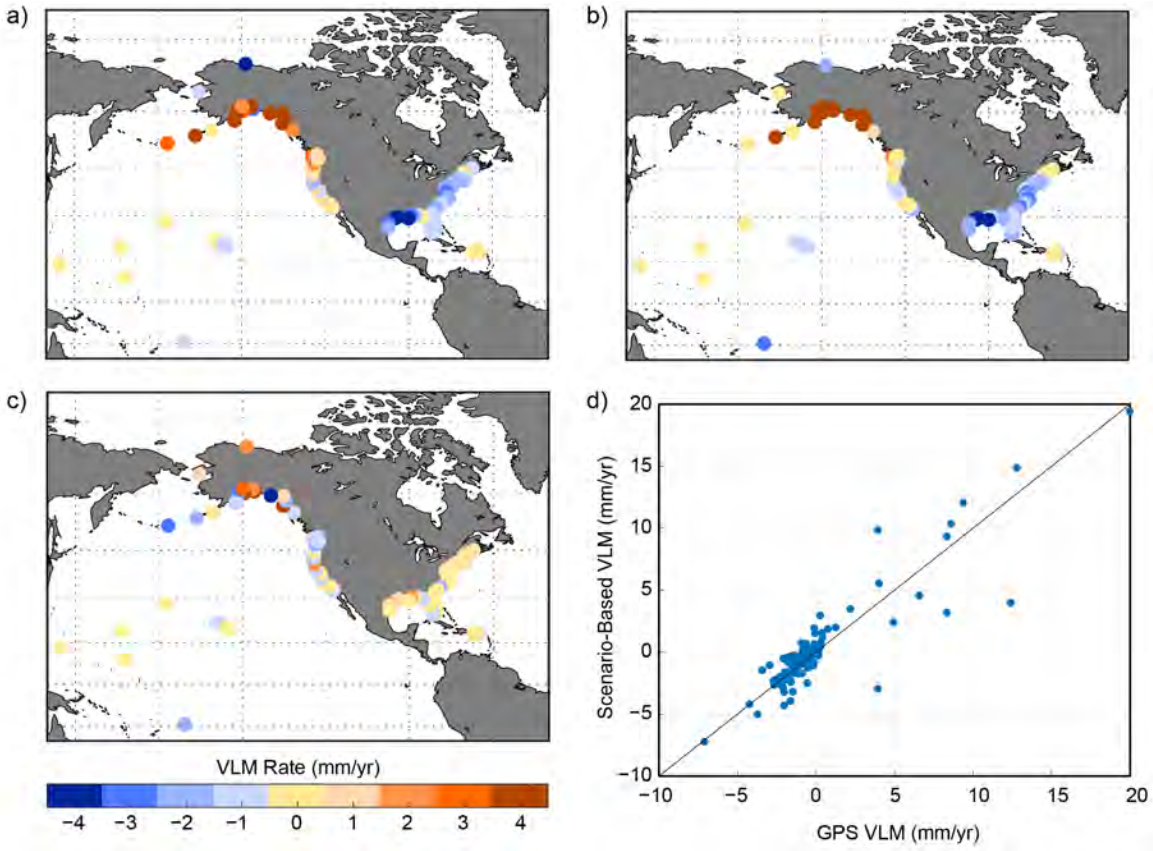

Figure 4.8: Comparison of vertical land motion (VLM) rate estimates (mm/year) from a) the scenario-based framework used in this report, and b) GPS-imaging estimates from Hammond et al. (2021). c) The difference between GPS-derived rates and scenario-derived rates and d) a comparison of the VLM estimates at the U.S. tide-gauge locations are also shown. Negative values of VLM reflect subsidence, while positive values reflect uplift.

Hampton Roads, Virginia

The historical long-term linear RSL rise rate at the Sewells Point, Virginia, tide gauge[44] is about 4.7 mm/year. More than half of this rate is estimated to be from downward VLM or subsidence with a rate of about 2.9 mm/year, which is close to previous estimates (Zervas, 2013; Kopp et al., 2014; Sweet et al., 2017). This subsidence is driven by both GIA and more localized groundwater withdrawal. If assumed to be linear and persistent into the future, VLM will contribute about 0.29 m to projections of RSL over the next 100 years. For example, by 2050 under the Intermediate-Low and Intermediate scenarios, the amount of RSL rise is projected to be between about 0.4 m and 0.45 m, respectively, with about 35% and 30% of that rise amount, respectively, from VLM.

However, VLM rates across the Hampton Roads region are not uniform. A past study (Eggleston and Pope, 2013) leveraged a variety of in situ observations to find a spatially varying pattern of subsidence ranging from 1.8 to 4.4 mm/year in the region from 1940 to 1971. The variations were connected to groundwater withdrawal in the region, which was captured via this assessment even with an effective spatial resolution on the order of tens of kilometers. More recently, InSAR rate maps have shown a range of subsidence from

[44] https://tidesandcurrents.noaa.gov/stationhome.html?id=8638610

about 1 mm to 5 mm/year in the region over the time period from 2014 to present, with locally higher rates (Figure 4.9; Buzzanga et al., 2020). Importantly, the satellite-based assessment revealed spatial variations on sub-kilometer scales, with some of the most prominent features in the spatial map connected to specific construction projects and land-use changes. With an average rate of subsidence around 3 mm/year over the course of the 21st century, VLM could contribute about 0.3 m to projected RSL, with locally higher amounts elsewhere in the region. Furthermore, comparing the InSAR-derived spatial pattern of VLM to that in either Eggleston and Pope (2013) or the gridded rates in this report provides important information about the linearity of VLM and the timescales on which VLM varies. There are considerable differences between the different assessments, indicating a shift in rates over the time periods considered. While it is necessary to consider the uncertainty in the VLM rate estimates and differences in measurement type, users of VLM information should assess land-use changes over the time periods considered along with the relevant processes driving VLM in the region. InSAR-derived VLM maps will play an increasingly key role in this assessment due to the spatial coverage and resolution provided by the satellites.

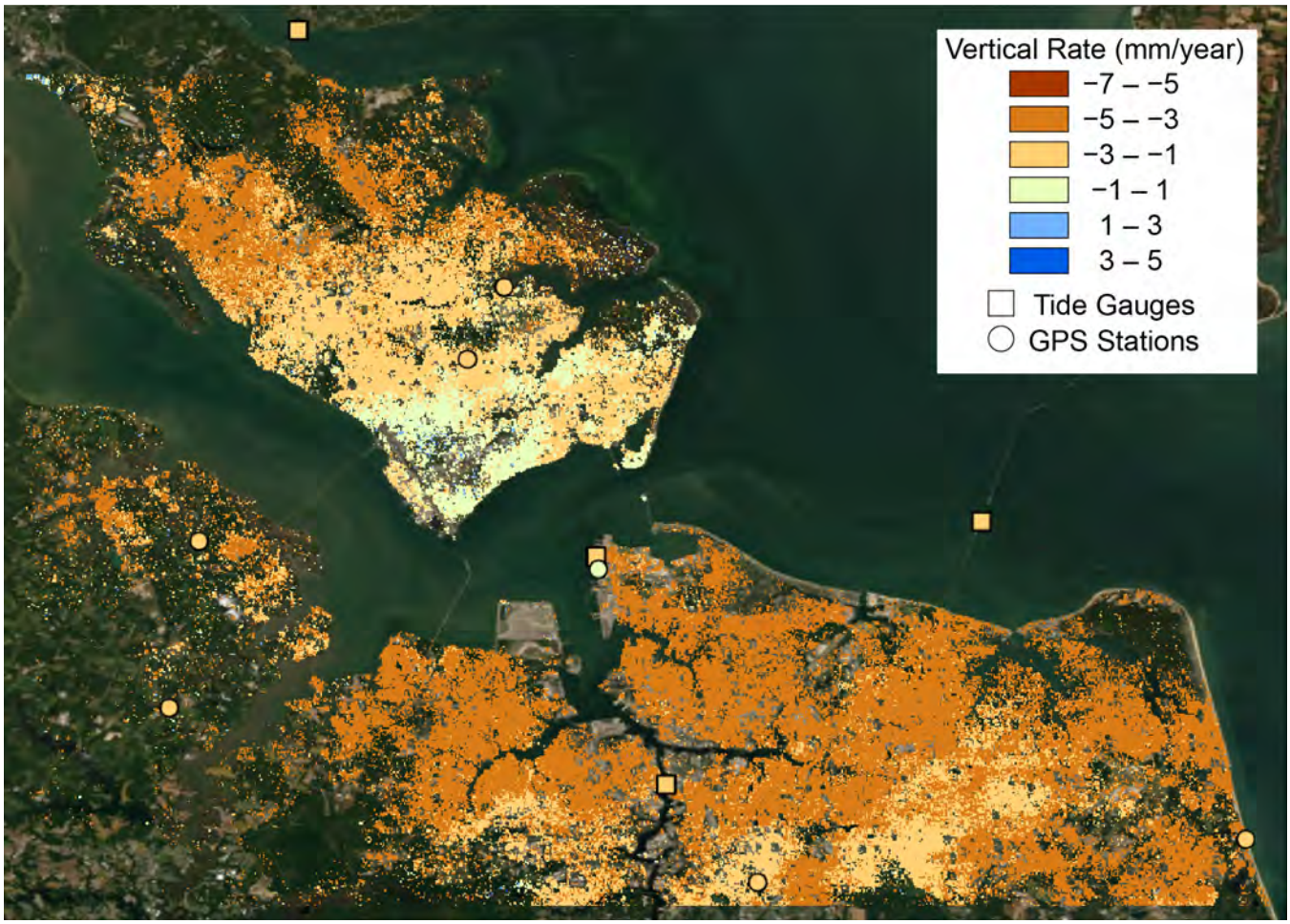

Figure 4.9: Map showing VLM rates (mm/year) for the Hampton Roads region displayed on top of satellite imagery. Higher rates of subsidence are indicated by darker orange colors. Of particular interest is the range of rates in such a small region (e.g., on the order of up to 5 mm/year difference in places). Based on Buzzanga et al. (2020).

Observing and Projecting Coastal Vertical Land Motion

While InSAR-measured VLM provides advantages over other measurement platforms in terms of spatial coverage and resolution, it should be considered in the context of the larger observing network when assessing VLM at the coast. In particular, InSAR serves two potential roles. First, InSAR can be used to provide ongoing monitoring of VLM at high spatial resolutions. InSAR has the potential to generate time series of VLM on a fine spatial scale. Subsidence "hotspots" can be identified along with abrupt shifts in VLM, which can assist in planning and executing adaptation efforts. For coastal communities attempting to alleviate subsidence in their region through efforts such as groundwater reinjection, InSAR provides a potentially better alternative to in situ monitoring to assess the effectiveness of these efforts. Second, InSAR can serve to assess spatial variability in VLM, filling in the gaps between tide gauges and GPS stations in coastal regions. The observations can then be combined in a statistical framework to provide more accurate projections of VLM with better estimates of uncertainty.

Assessing VLM with InSAR is not without challenges, however, although many of these are being addressed in ongoing and planned efforts. First, to be useful for assessing long-term VLM rates with the still relatively short satellite records, the shorter-term VLM rates can be calibrated and tied into the existing National Spatial Reference System (NSRS)[45] to improve accuracy and representativeness of long-term changes. Second, the availability and coverage of GPS in coastal regions impact the accuracy of VLM by InSAR. To provide a measurement of absolute VLM, InSAR needs to be tied to available GPS measurements. In areas with large gaps between GPS stations, this can lead to reduced accuracy of the InSAR estimates. Ideally, analysis would be conducted to determine optimal GPS station spacing for maintaining integrity of the InSAR-derived velocity field in various environments, including, but not limited to, regions of coastal subsidence, landslide/earthquake/volcanic activity, high plains aquifer depletion, and aquifer depletion in a tectonic area. Finally, InSAR VLM estimates are computationally expensive to perform over large regions, making national coverage a challenge. Efforts are underway, however, to generate a consistent surface displacement product (a preliminary step to estimating VLM) for the United States. A generalized approach for generating absolute VLM estimates from this product could then be created, paving the way for ongoing monitoring of VLM along the U.S. coastlines at high spatial resolutions.

To improve projections of VLM, InSAR alone is not sufficient. Instead, InSAR should be analyzed in tandem with available tide-gauge, GPS, and any other available in situ observations to assess both the spatial variability of VLM rates and potential non-linearities in the VLM rates estimated over these records. These non-linearities are critical for determining the future contribution of VLM to RSL. For example, the long-term rate assessed at a tide gauge as done in this report could differ significantly from the rate of VLM over the past decade because of a sustained land-use change. The comparison between the two types of VLM estimates in Figure 4.9 indicate that these shifts may be present at some locations along the U.S. coastlines and need to be assessed to improve projections of VLM.

[45] https://oceanservice.noaa.gov/education/tutorial_geodesy/geo08_spatref.html

Section 5: Conclusions

Sea level rise driven by global climate change is a clear and present risk to the United States, now and for the foreseeable future. It is the goal of the Sea Level Rise and Coastal Flood Hazard Scenarios and Tools Interagency Task Force to continue to provide projections and future scenarios to assist decision-makers for both planning and risk-bounding purposes. This report builds upon the progress made in Sweet et al. (2017), updating the GMSL scenarios and the associated local and regional RSL projections to reflect recent advances in sea level science, as well as expanding the types of scenario information provided to better serve stakeholder needs for coastal risk management and adaptation planning.

The major findings of this report are as follows:

Multiple lines of evidence provide increased confidence, regardless of the emissions pathway, in a narrower range of projected global, national, and regional sea level rise at 2050 than previously reported (Sweet et al., 2017).

Both trajectories assessed by extrapolating rates and accelerations estimated from historical tide-gauge observations, and model projections, fall within the same range in all cases, giving higher confidence in these relative sea level (RSL; land and ocean height changes) rise amounts by 2050. Specifically, RSL along the contiguous U.S. (CONUS) coastline is expected to rise, on average, as much over the next 30 years (0.25–0.30 m over 2020–2050) as it has over the last 100 years (1920–2020). Due to processes driving regional changes in sea level, the report found regional differences in both the modeled scenarios and observation-based extrapolations, with higher RSL rise along the East (0–5 cm higher on average than CONUS) and Gulf Coasts (10–15 cm higher) as compared to the West (10–15 cm lower) and Hawaiian/Caribbean (5–10 cm lower) Coasts.

For coastlines outside CONUS, and for individual regions and locations within CONUS, the projections can differ from the aforementioned mean values. In addition, it is important to note that the projections do not include natural year-to-year sea level variability that occurs along U.S. coastlines in response to climatic modes such as the El Niño–Southern Oscillation. Nevertheless, if we assume that regional sea level will keep following its present trajectory for the coming three decades, most U.S. regions are mostly tracking between the Intermediate-Low and Intermediate-High scenarios. Although the near-term observation-based extrapolations will continue to evolve over time with new observations and analyses, this updated information should help inform both near-term decisions and projects that may require decades' worth of planning prior to actual implementation.

By 2050, the expected relative sea level (RSL) will cause tide and storm surge heights to increase and will lead to a shift in U.S. coastal flood regimes, with major and moderate high tide flood events occurring as frequently as moderate and minor high tide flood events occur today. Without additional risk-reduction measures, U.S. coastal infrastructure, communities, and ecosystems will face significant consequences.

Minor/disruptive high tide flooding (HTF; about 0.55 m above mean higher high water [MHHW]) is projected to increase from a U.S average frequency of about 3 events/year in 2020 to >10 events/year by 2050. The projected increases for moderate/typically damaging (about 0.85 m above MHHW) and major/often destructive (about 1.20 m above MHHW) HTF are 0.3 events/year in 2020 to about 4 events/year in 2050 and 0.04 events/year in 2020 to 0.2 events/year by 2050, respectively. Across all severities (minor, moderate, major), HTF along the U.S. East and Gulf Coasts will largely continue to occur at or above the national average frequency.

In other words, much of the coastline is already close to a flood regime shift with respect to flood frequency and, consequently, damages. Only a small height difference (0.3–0.7 m) currently separates infrequent, damaging, or destructive HTF from the current regime of more frequent, so-called nuisance, flooding (whose impacts are in fact already remarkable throughout dozens of densely populated coastal cities). Decades ago, powerful storms were what typically caused coastal flooding, but due to RSL rise, even today's common wind events and seasonal high tides are already regularly flooding communities, and they will do so to an ever greater extent in the next few decades, affecting homes and businesses, overloading stormwater and wastewater systems, infiltrating coastal groundwater aquifers with saltwater, and stressing coastal wetlands and estuarine ecosystems.

Higher global temperatures increase the chances of higher sea level by the end of the century and beyond. The scenario projections of relative sea level (RSL) along the contiguous U.S. (CONUS) coastline are about 0.6–2.2 m in 2100 and 0.8–3.9 m in 2150 (relative to sea level in 2000); these ranges are driven by uncertainty in future emissions pathways and the response of the underlying physical processes.

With an increase in average global temperature of 2°C above preindustrial levels, and not considering the potential contributions from ice-sheet processes with limited agreement (low confidence) among modeling approaches, the probability of exceeding 0.5 m rise globally (0.7 m along the CONUS coastline) by 2100 is about 50%. With 3°–5°C of warming under high emissions pathways, this probability rises to >80% to >99%. The probability of exceeding 1 m globally (1.2 m CONUS) by 2100 rises from <5% with 3°C warming to almost 25% with 5°C warming. Considering low-confidence ice-sheet processes and high emissions pathways with warming approaching 5°C, these probabilities rise to about 50%, 20%, and 10% of exceeding 1.0 m, 1.5 m, or 2.0 m of global rise by 2100, respectively. While these low-confidence ice-sheet processes are unlikely to make significant contributions with 2°C of warming, how much warming might be required to trigger them is currently unknown.

In addition, as a result of improved understanding of the timing of possible large future contributions from ice-sheet loss, the "Extreme" scenario from the 2017 report (2.5 m GMSL rise by 2100) is now viewed as less plausible and has been removed from consideration. Nevertheless, the increased acceleration in the late 21st century and beyond means that the other high-end scenarios provide pathways that potentially reach this threshold in the decades immediately following 2100 (and continue rising). Regionally, the projections are near or higher than the global average in 2100 and 2150 for almost all U.S. coastlines due to vertical land motion (VLM); gravitational, rotational, and deformational effects due to land ice loss; and ocean circulation changes. Largely due to VLM, RSL projections are lower than the global amounts along the southern Alaska coast and are higher along the Eastern and Western Gulf coastlines.

Monitoring the sources of ongoing sea level rise and the processes driving changes in sea level is critical for assessing scenario divergence and tracking the trajectory of observed sea level rise, particularly during the time period when future emissions pathways lead to increased ranges in projected sea level rise.

Efforts are currently under way to narrow the uncertainties in ice-sheet dynamics and future sea level rise amounts in response to increasing greenhouse gas forcing and associated global warming. Early indicators of changes in sea level rise trajectories can serve to trigger adaptive management plans and are identified through continuous monitoring and assessment of changes in sea level (on global and local scales) and of the key drivers of sea level change that most affect U.S. coastlines, such as ocean heat content, ice-mass loss from Greenland and Antarctica, vertical land motion, and Gulf Stream system changes.

As emphasized in the summary findings above, beyond 2050 the amount of sea level rise is strongly affected by future global warming. By reducing greenhouse gas (GHG) emissions, severe and transformative

impacts occurring later this century or early next century along U.S. coastlines are more likely to be avoided. As GHG emissions and global temperatures continue to rise, the likelihood of very high U.S. sea level rise does too. If global warming reaches 2°C (warming levels are already >1°C), corresponding to a 50% chance that U.S. sea level as a whole will rise at least 0.7 m by 2100 and 1.2 m by 2150 (measured since 2000), major HTF by 2100 would occur more often than minor HTF occurs today in many coastal communities if risk-reduction action is not taken. If global mean temperatures were to rise as high as about 3°–5°C, much larger amounts of sea level rise would become increasingly possible, as instabilities in ice-sheet dynamics would potentially come into play. Constant monitoring of global to local sea levels and their source contributions by Federal agencies, such as NOAA and NASA, will be key to help assess potential trajectory divergence for triggering adaptive management plans.

The updated sea level scenarios and the EWL probability datasets in this study are being delivered or planned via numerous agency data servers, tools, and associated guidance products. Additionally, this report is a key technical input to the Fifth National Climate Assessment (NCA5 currently under way), and the datasets and derived information are being delivered to the NCA5 author teams. In terms of next steps, the Task Force will continue to refine these sea level projections and extreme (e.g., high tides, storms) water level probabilities while working to improve understanding of the implications of these projections for coastal hazards (e.g., flooding, erosion, and rising water tables), societal exposure and risk, infrastructure vulnerability, ecosystem health (including habitat transformation/loss), and cascading societal impacts. In order to do so, additional and improved observations and more sophisticated modeling approaches that incorporate the relevant physical processes (e.g., waves; see Box 3.1) will be needed at the regional scale, with local granularity to assess the impacts of these coastal hazards. Such information is expected to ultimately feed into the next generation of interagency reports and assessments to enable informed climate adaptation planning.

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Section A1: Tables and Figures

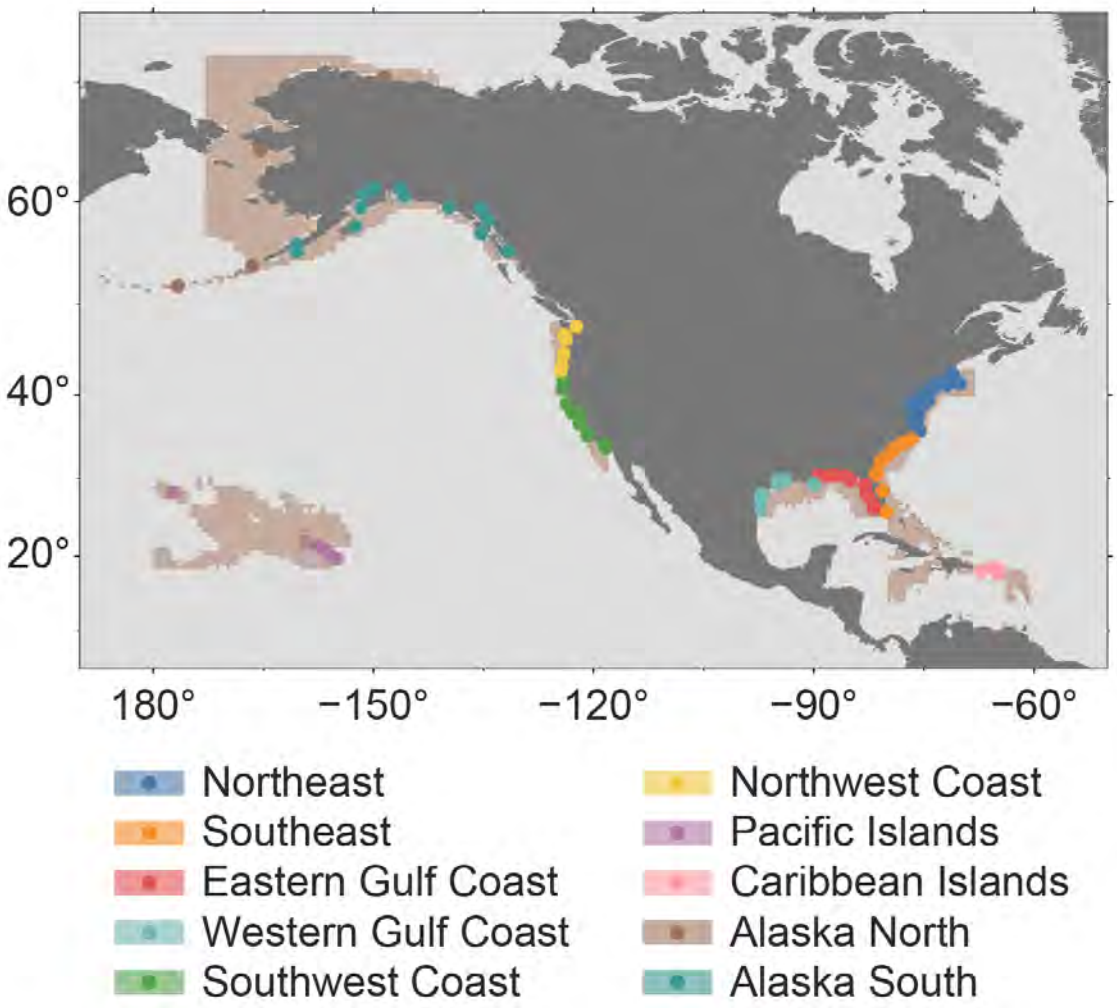

Figure A1.1: Region definitions for observation-based extrapolations and scenarios in Section 2. These regions are used both to group tide gauges and also to generate regional averages for the gridded scenarios. A bathymetry mask is used to define the regions for the gridded scenarios.

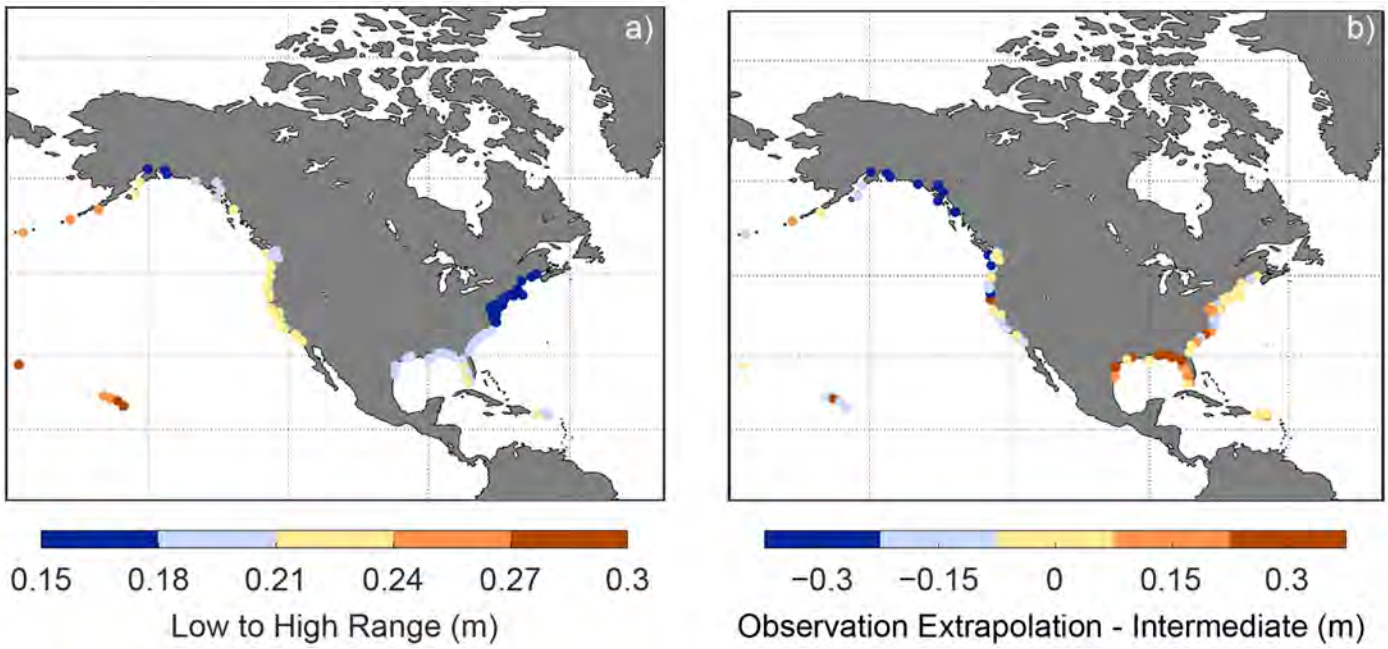

Figure A1.2. Shown for each tide gauge record with at least 30 years of record length between 1970 and 2020 are a) range, in meters, between median projection of Low and High Scenarios in 2050, and b) difference, in meters, between median observation-based extrapolation and Intermediate scenario in 2050.

Table A1.1: Projections methods employed.

Driver of GMSL or RSL change	Kopp et al. (2014) projection method (used in Sweet et al., 2017)	AR6 (Fox-Kemper et al., 2021) projection methods (used here)
Thermal expansion	CMIP5 ensemble drift-corrected zostoga	Two-layer model with climate sensitivity calibrated to the IPCC assessment and expansion coefficients calibrated to emulate CMIP6 models
Greenland ice sheet	*Likely* range from IPCC AR5, with shape of tails based on structured expert judgment (Bamber and Aspinall, 2013)	1. Emulated ISMIP6 simulations through 2100 (Edwards et al., 2021), extended after 2100 based on constant post-2100 rates 2. Structured expert judgment (Bamber et al., 2019)
Antarctic ice sheet	*Likely* range from IPCC AR5, with shape of tails based on structured expert judgment (Bamber and Aspinall, 2013)	1. Emulated ISMIP6 simulations through 2100 (Edwards et al., 2021), extended after 2100 with constant rates based on the IPCC AR5 parametric Antarctic Ice Sheet model (Church et al., 2013) 2. LARMIP-2 simulations (Levermann et al., 2020) augmented by AR5 surface mass balance model (Church et al., 2013), extended past 2100 based on constant rates 3. Single ice-sheet model incorporated marine ice cliff instability (DeConto et al., 2021) 4. Structured expert judgment (Bamber et al., 2019)
Glaciers	Distribution based on Marzeion et al. (2012) surface mass balance model	Emulated GlacierMIP (Marzeion et al., 2020; Edwards et al., 2021) extended after 2100 with IPCC AR5 parametric model refit to GlacierMIP (Marzeion et al., 2020)
Land water storage	Groundwater depletion: Population/groundwater depletion relationship calibrated based on Konikow (2011) and Wada et al. (2012) Water impoundment: Population/dam impoundment relationship calibrated based on Chao et al. (2008)	Groundwater depletion: Updated population/groundwater depletion relationship calibrated based on Konikow (2011) and Wada et al. (2012, 2016) Water impoundment: Population/dam impoundment relationship calibrated based on Chao et al. (2008), adjusted for new construction, following Hawley et al. (2020) for 2020 to 2040
Ocean dynamic sea level	Distribution derived from CMIP5 ensemble zos field	Distribution derived from CMIP6 ensemble zos field after linear drift removal
Gravitational, rotational, and deformational effects	Sea-level equation solver (Mitrovica et al., 2011) driven by projections of ice-sheet and glacier changes	Sea-level equation solver (Slangen et al., 2014) driven by projections of ice-sheet, glacier, and land water storage changes
GIA and other drivers of VLM	Spatiotemporal statistical model of tide-gauge data	Spatiotemporal statistical model of tide-gauge data (updated from Kopp et al., 2014)

Table A1.2: Offsets, in meters, for different time periods and for each region considered in Section 2. These offsets are assessed using the trajectory determined from the available tide-gauge data in each region.

	1992–2000	2000–2005	2005–2020
Contiguous U.S.	0.02	0.03	0.08
Northeast	0.03	0.02	0.09
Southeast	0.03	0.02	0.09
Eastern Gulf	0.03	0.02	0.1
Western Gulf	0.05	0.04	0.14
Southwest	0.01	0.01	0.05
Northwest	0.01	0.01	0.04
Hawaiian Islands	0.02	0.02	0.06
Caribbean	0.02	0.01	0.06

Table A1.3: Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
Pacific	39509	1611400	Nawiliwili, HI	21.95	−159.36	0.558	0.244	1.7	1983–2001	0.522	0.817	1.192
	39511	1612340	Honolulu, HI	21.31	−157.87	0.580	0.248	1.3	1983–2001	0.523	0.817	1.193
	39511	1612480	Mokuoloe, HI	21.43	−157.79	0.646	0.265	2.0	1983–2001	0.526	0.819	1.196
	39153	1615680	Kahului, HI	20.90	−156.48	0.686	0.252	2.1	1983–2001	0.527	0.821	1.197
	39154	1617433	Kawaihae, HI	20.04	−155.83	0.659	0.237	7.9	1983–2001	0.526	0.820	1.196
	38795	1617760	Hilo, HI	19.73	−155.06	0.731	0.272	3.1	1983–2001	0.529	0.822	1.199
	37704	1619000	Johnston Atoll	16.74	−169.53	0.674	0.295	2.2	1983–2001	0.527	0.820	1.197
	42004	1619910	Midway Islands	28.21	−177.36	0.381	0.303	1.9	1983–2001	0.515	0.811	1.185
	36941	1630000	Apra Harbor, Guam	13.44	144.65	0.715	0.249	4.2	1983–2001	0.529	0.821	1.199
	36941	1631428	Pago Bay, Guam	13.43	144.80	0.525	0.287	4.2	1983–2001	0.521	0.816	1.191
	26574	1770000	American Samoa	−14.28	189.32	0.848	0.338	3.8	1983–2001	0.497	0.788	1.167
	35169	1820000	Kwajalein	8.73	167.74	1.194	0.446	3.1	1983–2001	0.548	0.836	1.218
	39117	1890000	Wake Island	19.29	166.62	0.718	0.295	2.1	1983–2001	0.529	0.822	1.199
NE	47859	8410140	Eastport, ME	44.90	−66.98	5.874	0.930	2.1	1983–2001	0.735	0.976	1.405
	47858	8411250	Cutler Naval Base, ME	44.64	−67.30	4.133	0.716	2.4	1983–2001	0.665	0.924	1.335
	47857	8413320	Bar Harbor, ME	44.39	−68.21	3.465	0.657	2.1	1983–2001	0.639	0.904	1.309
	47496	8418150	Portland, ME	43.66	−70.25	3.019	0.605	1.9	1983–2001	0.621	0.891	1.291
	47496	8419317	Wells, ME	43.32	−70.56	2.914	0.667	3.5	1983–2001	0.617	0.887	1.287
	47496	8423898	Fort Point, NH	43.07	−70.71	2.864	0.662	3.5	1983–2001	0.615	0.886	1.285
	47136	8443970	Boston, MA	42.35	−71.05	3.131	0.634	2.8	1983–2001	0.625	0.894	1.295
	46777	8447386	Fall River, MA	41.70	−71.16	1.456	0.566	3.5	1983–2001	0.558	0.844	1.228
	46778	8447930	Woods Hole, MA	41.52	−70.67	0.672	0.446	3.2	1983–2001	0.527	0.820	1.197
	46778	8449130	Nantucket Island, MA	41.29	−70.10	1.089	0.418	3.8	1983–2001	0.544	0.833	1.214
	46777	8452660	Newport, RI	41.51	−71.33	1.174	0.478	2.8	1983–2001	0.547	0.835	1.217

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
NE (cont.)	46777	8452944	Conimicut Light, RI	41.72	−71.34	1.398	0.560	3.5	1983–2001	0.556	0.842	1.226
	46777	8454000	Providence, RI	41.81	−71.40	1.476	0.549	2.3	1983–2001	0.559	0.844	1.229
	46777	8454049	Quonset Point, RI	41.59	−71.41	1.249	0.547	3.5	1983–2001	0.550	0.837	1.220
	46776	8461490	New London, CT	41.36	−72.09	0.930	0.468	2.6	1983–2001	0.537	0.828	1.207
	46776	8465705	New Haven, CT	41.28	−72.91	2.045	0.603	3.5	1983–2001	0.582	0.861	1.252
	46775	8467150	Bridgeport, CT	41.17	−73.18	2.231	0.555	3.0	1983–2001	0.589	0.867	1.259
	46777	8510560	Montauk, NY	41.05	−71.96	0.771	0.487	3.4	1983–2001	0.531	0.823	1.201
	46416	8514560	Port Jefferson, NY	40.95	−73.08	2.181	0.527	2.5	1983–2001	0.587	0.865	1.257
	46416	8516945	Kings Point, NY	40.81	−73.76	2.378	0.638	2.5	1983–2001	0.597	0.873	1.267
	46415	8518750	The Battery, NY	40.70	−74.01	1.542	0.546	3.1	1983–2001	0.562	0.846	1.232
	46415	8519483	Bergen Point, NY	40.64	−74.14	1.681	0.549	4.4	1983–2001	0.567	0.850	1.237
	46415	8531680	Sandy Hook, NJ	40.47	−74.01	1.593	0.552	2.7	1983–2001	0.564	0.848	1.234
	46056	8534720	Atlantic City, NJ	39.36	−74.42	1.403	0.534	4.1	1983–2001	0.556	0.842	1.226
	45697	8536110	Cape May, NJ	38.97	−74.96	1.659	0.486	4.7	1983–2001	0.566	0.850	1.236
	46055	8537121	Ship John Shoal, NJ	39.31	−75.38	1.894	0.578	3.5	1983–2001	0.576	0.857	1.246
	46055	8540433	Marcus Hook, PA	39.81	−75.41	1.871	0.563	3.5	1983–2001	0.575	0.856	1.245
	46055	8545240	Philadelphia, PA	39.93	−75.14	2.039	0.462	3.1	1983–2001	0.582	0.861	1.252
	46055	8551762	Delaware City, DE	39.58	−75.59	1.830	0.540	3.5	1983–2001	0.573	0.855	1.243
	46055	8551910	Reedy Point, DE	39.56	−75.57	1.779	0.423	4.1	1983–2001	0.571	0.853	1.241
	45696	8555889	Brandywine Shoal, DE	38.99	−75.11	1.676	0.616	3.5	1983–2001	0.567	0.850	1.237
	45696	8557380	Lewes, DE	38.78	−75.12	1.418	0.530	3.5	1983–2001	0.557	0.843	1.227
	45696	8570280	Ocean City, MD	38.33	−75.08	1.187	0.413	3.5	1983–2001	0.547	0.836	1.217
	45696	8570283	Ocean City Inlet, MD	38.33	−75.09	0.751	0.360	3.5	1983–2001	0.530	0.823	1.200
	45695	8571421	Bishops Head, MD	38.22	−76.04	0.624	0.503	3.5	1983–2001	0.525	0.819	1.195

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
NE (cont.)	45695	8571892	Cambridge, MD	38.57	−76.07	0.622	0.414	4.9	1983–2001	0.525	0.819	1.195
	46054	8573364	Tolchester Beach, MD	39.21	−76.25	0.527	0.484	2.5	1983–2001	0.519	0.814	1.189
	46055	8573927	Chesapeake City, MD	39.53	−75.81	0.980	0.470	3.8	1983–2001	0.539	0.829	1.209
	46054	8574070	Havre De Grace, MD	39.54	−76.09	0.746	0.482	3.5	1983–2001	0.530	0.822	1.200
	46054	8574680	Baltimore, MD	39.27	−76.58	0.506	0.443	3.2	1983–2001	0.520	0.815	1.190
	45695	8575512	Annapolis, MD	38.98	−76.48	0.438	0.430	3.7	1983–2001	0.518	0.813	1.188
	45695	8577330	Solomons Island, MD	38.32	−76.45	0.449	0.398	6.0	1983–2001	0.518	0.813	1.188
	45694	8594900	Washington, DC	38.87	−77.02	0.965	0.461	3.3	1983–2001	0.539	0.829	1.209
	45337	8631044	Wachapreague, VA	37.61	−75.69	1.376	0.508	5.4	1983–2001	0.564	0.850	1.234
	45337	8632200	Kiptopeke, VA	37.17	−75.99	0.896	0.435	4.7	1983–2001	0.536	0.827	1.206
	45695	8635150	Colonial Beach, VA	38.25	−76.96	0.591	0.406	4.7	1983–2001	0.524	0.818	1.194
	45336	8635750	Lewisetta, VA	38.00	−76.46	0.458	0.420	5.6	1983–2001	0.518	0.814	1.188
	45336	8636580	Windmill Point, VA	37.62	−76.29	0.424	0.419	5.2	1983–2001	0.532	0.828	1.202
	45336	8637689	Yorktown, VA	37.23	−76.48	0.786	0.567	3.5	1983–2001	0.531	0.824	1.201
	44977	8638610	Sewells Point, VA	36.95	−76.33	0.841	0.502	4.6	1983–2001	0.534	0.825	1.204
	44977	8638863	CBBT, VA	36.97	−76.11	0.885	0.503	6.0	1983–2001	0.535	0.827	1.205
	44977	8639348	Money Point, VA	36.78	−76.30	0.977	0.528	5.6	1983–2001	0.539	0.829	1.209

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
SE	44978	8651370	Duck, NC	36.18	−75.75	1.124	0.494	4.6	1983–2001	0.545	0.834	1.215
	44619	8652587	Oregon Inlet, NC	35.80	−75.55	0.360	0.384	4.6	1983–2001	0.514	0.811	1.184
	44619	8654400	Cape Hatteras, NC	35.22	−75.64	1.056	0.412	3.2	1983–2001	0.542	0.832	1.212
	44619	8654467	USCG Hatteras, NC	35.21	−75.70	0.186	0.598	3.2	1983–2001	0.507	0.806	1.177
	44259	8656483	Beaufort, NC	34.72	−76.67	1.079	0.362	3.8	1983–2001	0.543	0.832	1.213
	44258	8658120	Wilmington, NC	34.23	−77.95	1.427	0.327	2.3	1983–2001	0.557	0.843	1.227
	44258	8658163	Wrightsville Beach, NC	34.21	−77.79	1.366	0.564	3.2	1983–2001	0.555	0.841	1.225
	43898	8661070	Springmaid Pier, SC	33.66	−78.92	1.707	0.493	2.9	1983–2001	0.568	0.851	1.238
	43897	8662245	Oyster Landing, SC	33.35	−79.19	1.561	0.496	3.2	1983–2001	0.562	0.847	1.232
	43538	8665530	Charleston, SC	32.78	−79.93	1.757	0.453	3.3	1983–2001	0.570	0.853	1.240
	43537	8670870	Fort Pulaski, GA	32.03	−80.90	2.287	0.500	3.3	1983–2001	0.591	0.869	1.261
	42818	8720030	Fernandina Beach, FL	30.67	−81.47	1.999	0.473	2.3	1983–2001	0.580	0.860	1.250
	42818	8720218	Mayport, FL	30.40	−81.43	1.508	0.378	2.6	1983–2001	0.557	0.842	1.227
	42818	8720357	St Johns River, FL	30.19	−81.69	0.312	0.333	3.2	1983–2001	0.512	0.809	1.182
	42459	8720587	St. Augustine Beach, FL	29.86	−81.26	1.569	0.531	3.2	1983–2001	0.563	0.847	1.233
	42101	8721604	Trident Pier, FL	28.42	−80.59	1.193	0.407	5.1	1983–2001	0.537	0.825	1.207
	41024	8723214	Virginia Key, FL	25.73	−80.16	0.667	0.317	5.1	1983–2001	0.518	0.811	1.188
	40664	8723970	Vaca Key, FL	24.71	−81.11	0.297	0.249	4.2	1983–2001	0.512	0.809	1.182
	40664	8724580	Key West, FL	24.56	−81.81	0.551	0.262	2.5	1983–2001	0.522	0.817	1.192

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
E. Gulf	41382	8725110	Naples, FL	26.13	−81.81	0.875	0.323	2.9	1983–2001	0.535	0.826	1.205
	41382	8725520	Fort Myers, FL	26.65	−81.87	0.401	0.325	3.1	1983–2001	0.516	0.812	1.186
	41740	8726384	Port Manatee, FL	27.64	−82.56	0.669	0.260	6.6	1983–2001	0.527	0.820	1.197
	41740	8726520	St Petersburg, FL	27.76	−82.63	0.688	0.337	2.8	1983–2001	0.528	0.821	1.198
	41740	8726607	Old Port Tampa, FL	27.86	−82.55	0.749	0.304	3.2	1983–2001	0.530	0.822	1.200
	41740	8726667	Mckay Bay Entrance, FL	27.91	−82.43	0.814	0.320	3.2	1983–2001	0.533	0.824	1.203
	41740	8726724	Clearwater Beach, FL	27.98	−82.83	0.841	0.294	7.1	1983–2001	0.540	0.831	1.210
	42457	8727520	Cedar Key, FL	29.14	−83.03	1.157	0.415	2.2	1983–2001	0.546	0.835	1.216
	42456	8728690	Apalachicola, FL	29.73	−84.98	0.492	0.390	3.0	1983–2001	0.520	0.815	1.190
	42814	8729108	Panama City, FL	30.15	−85.67	0.409	0.368	2.5	1983–2001	0.516	0.812	1.186
	42814	8729210	Panama City Beach, FL	30.21	−85.88	0.420	0.348	4.3	1983–2001	0.517	0.813	1.187
	42812	8729840	Pensacola, FL	30.40	−87.21	0.383	0.345	2.4	1983–2001	0.515	0.811	1.185
	42812	8732828	Mobile Bay, AL	30.42	−87.83	0.490	0.519	4.3	1983–2001	0.520	0.815	1.190
	42811	8735180	Dauphin Island, AL	30.25	−88.08	0.367	0.354	4.3	1983–2001	0.512	0.808	1.182
	42811	8736897	Mobile, AL	30.65	−88.06	0.517	0.535	4.3	1983–2001	0.521	0.816	1.191
	42811	8737048	Mobile State Docks, AL	30.71	−88.04	0.501	0.439	4.3	1983–2001	0.520	0.815	1.190
	42811	8741533	Pascagoula NOAA Lab, MS	30.37	−88.56	0.466	0.494	4.3	1983–2001	0.519	0.814	1.189
	42810	8747437	Bay Waveland Yacht Club, MS	30.33	−89.33	0.529	0.498	4.6	1983–2001	0.522	0.816	1.192

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
W. Gulf	42092	8760922	Pilots Station East, SW Pass, LA	28.93	−89.41	0.356	0.399	4.3	2012–2016	0.514	0.811	1.184
	42451	8761724	Grand Isle, LA	29.26	−89.96	0.323	0.309	7.8	2012–2016	0.428	0.725	1.098
	42809	8761927	New Canal Station, LA	30.03	−90.11	0.164	0.485	5.6	1983–2001	0.507	0.805	1.177
	42450	8762075	Port Fourchon, LA	29.11	−90.20	0.368	0.298	4.3	2012–2016	0.515	0.811	1.185
	42449	8764227	Amerada Pass, LA	29.45	−91.34	0.487	0.535	4.3	1983–2001	0.519	0.815	1.189
	42449	8765251	Cypremort Point, LA	29.71	−91.88	0.518	0.458	4.3	1983–2001	0.521	0.816	1.191
	42448	8766072	Freshwater Canal Locks, LA	29.56	−92.31	0.657	0.696	4.3	1983–2001	0.526	0.820	1.196
	42806	8767816	Lake Charles, LA	30.22	−93.22	0.427	0.494	4.3	1983–2001	0.517	0.813	1.187
	42447	8768094	Calcasieu Pass, LA	29.77	−93.34	0.589	0.465	6.1	1983–2001	0.524	0.818	1.194
	42447	8770570	Sabine Pass North, TX	29.73	−93.87	0.488	0.368	6.1	1983–2001	0.520	0.815	1.190
	42446	8770613	Morgans Point, TX	29.68	−94.99	0.398	0.488	3.1	1983–2001	0.535	0.831	1.205
	42446	8771013	Eagle Point, TX	29.48	−94.92	0.338	0.331	13.8	1983–2001	0.494	0.790	1.164
	42446	8771341	Galveston Bay Entrance, TX	29.36	−94.72	0.510	0.499	6.1	1983–2001	0.520	0.815	1.190
	42446	8771450	Galveston Pier 21, TX	29.31	−94.79	0.429	0.366	6.5	1983–2001	0.517	0.813	1.187
	42446	8771510	Galveston Pleasure Pier, TX	29.29	−94.79	0.622	0.425	6.5	1983–2001	0.525	0.819	1.195
	42086	8772440	Freeport, TX	28.95	−95.31	0.536	0.391	9.0	1983–2001	0.521	0.816	1.191
	42086	8772447	USCG Freeport, TX	28.94	−95.30	0.549	0.460	6.1	1983–2001	0.522	0.816	1.192
	42084	8774770	Rockport, TX	28.02	−97.05	0.111	0.336	5.7	2002–2006	0.504	0.803	1.174
	41725	8775870	Corpus Christi, TX	27.58	−97.22	0.497	0.391	4.8	1983–2001	0.529	0.824	1.199
	41366	8779770	Port Isabel, TX	26.06	−97.22	0.418	0.337	4.0	1983–2001	0.517	0.813	1.187

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
SW	43500	9410170	San Diego, CA	32.71	−117.17	1.745	0.490	2.2	1983–2001	0.570	0.852	1.240
	43500	9410230	La Jolla, CA	32.87	−117.26	1.624	0.468	2.1	1983–2001	0.565	0.849	1.235
	43858	9410660	Los Angeles, CA	33.72	−118.27	1.674	0.472	1.0	1983–2001	0.567	0.850	1.237
	44217	9410840	Santa Monica, CA	34.01	−118.50	1.654	0.489	1.8	1983–2001	0.566	0.850	1.236
	44216	9411340	Santa Barbara, CA	34.41	−119.69	1.645	0.485	0.6	1983–2001	0.566	0.849	1.236
	44574	9412110	Port San Luis, CA	35.18	−120.76	1.623	0.449	1.0	1983–2001	0.565	0.849	1.235
	44932	9413450	Monterey, CA	36.61	−121.89	1.627	0.431	1.6	1983–2001	0.565	0.849	1.235
	45290	9414290	San Francisco, CA	37.81	−122.47	1.780	0.375	1.9	1983–2001	0.571	0.853	1.241
	45290	9414523	Redwood City, CA	37.51	−122.21	2.501	0.400	2.7	1983–2001	0.600	0.875	1.270
	45290	9414750	Alameda, CA	37.77	−122.30	2.010	0.411	0.4	1983–2001	0.580	0.860	1.250
	45290	9414863	Richmond, CA	37.93	−122.40	1.846	0.359	3.1	1983–2001	0.574	0.855	1.244
	45290	9415020	Point Reyes, CA	38.00	−122.98	1.758	0.447	2.1	1983–2001	0.570	0.853	1.240
	45649	9415144	Port Chicago, CA	38.06	−122.04	1.498	0.388	1.4	1983–2001	0.560	0.845	1.230
	45648	9416841	Arena Cove, CA	38.91	−123.71	1.787	0.500	0.6	1983–2001	0.573	0.856	1.243
	46365	9418767	North Spit, CA	40.77	−124.22	2.090	0.491	4.8	1983–2001	0.584	0.863	1.254
	46724	9419750	Crescent City, CA	41.75	−124.18	2.095	0.548	-0.8	1983–2001	0.584	0.863	1.254
	47083	9431647	Port Orford, OR	42.74	−124.50	2.220	0.594	0.2	1983–2001	0.572	0.850	1.242
	47442	9432780	Charleston, OR	43.35	−124.32	2.323	0.586	1.1	1983–2001	0.593	0.870	1.263
	47801	9435380	South Beach, OR	44.63	−124.04	2.543	0.579	1.7	1983–2001	0.602	0.876	1.272
	48161	9437540	Garibaldi, OR	45.55	−123.92	2.536	0.597	2.4	1983–2001	0.601	0.876	1.271
	48520	9439040	Astoria, OR	46.21	−123.77	2.624	0.629	−0.2	1983–2001	0.605	0.879	1.275

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
NW	48520	9440910	Toke Point, WA	46.71	−123.97	2.720	0.807	0.6	1983–2001	0.609	0.882	1.279
	48519	9441102	Westport, WA	46.90	−124.11	2.786	0.670	1.9	1983–2001	0.611	0.884	1.281
	48878	9442396	La Push, WA	47.91	−124.64	2.577	0.766	1.9	1983–2001	0.603	0.877	1.273
	49237	9443090	Neah Bay, WA	48.37	−124.61	2.425	0.688	−1.7	1983–2001	0.597	0.873	1.267
	49238	9444090	Port Angeles, WA	48.13	−123.44	2.153	0.562	0.2	1983–2001	0.586	0.865	1.256
	49239	9444900	Port Townsend, WA	48.11	−122.76	2.597	0.538	1.7	1983–2001	0.604	0.878	1.274
	48880	9446484	Tacoma, WA	47.27	−122.41	3.595	0.517	3.4	1983–2001	0.644	0.908	1.314
	48880	9447130	Seattle, WA	47.60	−122.34	3.462	0.541	2.1	1983–2001	0.639	0.904	1.309
	49239	9449424	Cherry Point, WA	48.86	−122.76	2.788	0.585	0.4	1983–2001	0.612	0.884	1.282
	49238	9449880	Friday Harbor, WA	48.55	−123.01	2.364	0.554	1.2	1983–2001	0.595	0.871	1.265
Alaska	51743	9450460	Ketchikan, AK	55.33	−131.63	4.708	1.086	−0.4	1983–2001	2.059	2.359	2.759
	52099	9451054	Port Alexander, AK	56.25	−134.65	3.329	0.738	−5.8	1983–2001	1.031	1.331	1.731
	52457	9451600	Sitka, AK	57.05	−135.34	3.029	0.768	−2.4	1983–2001	0.883	1.183	1.583
	52817	9452210	Juneau, AK	58.30	−134.41	4.970	1.152	−15.1	2012–2016	2.319	2.619	3.019
	53175	9452400	Skagway, AK	59.45	−135.33	5.100	1.218	−19.9	2012–2016	2.456	2.756	3.156
	52815	9452634	Elfin Cove, AK	58.19	−136.35	3.360	1.149	−5.8	1983–2001	1.048	1.348	1.748
	53171	9453220	Yakutat, Yakutat Bay, AK	59.55	−139.73	3.070	0.891	−10.7	2012–2016	0.902	1.202	1.602
	53524	9454050	Cordova, AK	60.56	−145.75	3.838	0.937	0.8	1983–2001	1.344	1.644	2.044
	53882	9454240	Valdez, AK	61.13	−146.36	3.702	0.878	−5.8	1983–2001	1.253	1.553	1.953
	53520	9455090	Seward, AK	60.12	−149.43	3.238	0.884	−4.0	1983–2001	0.983	1.283	1.683
	53159	9455500	Seldovia, AK	59.44	−151.72	5.499	1.350	−9.8	2012–2016	2.906	3.206	3.606
	53518	9455760	Nikiski, AK	60.68	−151.40	6.262	1.254	−9.9	2012–2016	NaN	NaN	NaN
	53879	9455920	Anchorage, AK	61.24	−149.89	8.889	1.269	−2.7	1983–2001	NaN	NaN	NaN
	52440	9457292	Kodiak Island, AK	57.73	−152.51	2.675	0.715	−9.2	2012–2016	0.743	1.043	1.443

Table A1.3 (cont.): Regional designation, tide gauge information, extreme water level metadata, and high tide flood heights.

US Region	EWL Grid No.	NOAA ID	Location	Latitude	Longitude	Tide Range (m)	Flood Index u (m, MHHW)	u Trend (mm/yr)	Epoch of u	Minor Flood (m, MHHW)	Moderate Flood (m)	Major Flood (m)
Alaska (cont.)	52079	9457804	Alitak, AK	56.90	−154.25	3.578	0.908	−5.8	2012–2016	1.174	1.474	1.874
	51714	9459450	Sand Point, AK	55.34	−160.50	2.204	0.737	1.4	1983–2001	0.615	0.915	1.315
	51712	9459881	King Cove, AK	55.06	−162.33	2.082	0.753	−5.8	1983–2001	0.592	0.892	1.292
	50262	9461380	Adak Island, AK	51.86	−176.63	1.131	NaN	NaN	NaN	0.572	0.872	1.272
	50623	9461710	Atka, AK	52.23	−174.17	1.041	0.424	−5.8	1983–2001	0.584	0.884	1.284
	50629	9462450	Nikolski, AK	52.94	−168.87	1.213	0.537	−5.8	1983–2001	0.563	0.863	1.263
	50990	9462620	Unalaska, AK	53.88	−166.54	1.098	NaN	NaN	NaN	0.576	0.876	1.276
	51714	9463502	Port Moller, AK	55.99	−160.57	3.175	0.697	−5.8	1983–2001	0.952	1.252	1.652
	52422	9464212	Village Cove, AK	57.13	−170.29	1.005	NaN	NaN	NaN	0.589	0.889	1.289
	54940	9468756	Nome, AK	64.50	−165.43	0.464	NaN	NaN	NaN	0.719	1.019	1.419
	56018	9491094	Red Dog Dock, AK	67.58	−164.07	0.269	NaN	NaN	NaN	0.787	1.087	1.487
	57111	9497645	Prudhoe Bay, AK	70.40	−148.53	0.214	NaN	NaN	NaN	0.808	1.108	1.508
Carib	38168	9751364	St. Croix, VI	17.75	−64.71	0.226	0.205	2.4	1983–2001	0.509	0.807	1.179
	38527	9751381	St. John, VI	18.32	−64.72	0.252	0.210	2.4	1983–2001	0.510	0.808	1.180
	38168	9751401	Lime Tree Bay, VI	17.69	−64.75	0.216	0.154	3.0	1983–2001	0.509	0.806	1.179
	38527	9751639	Charlotte Amalie, VI	18.34	−64.92	0.240	0.172	2.3	1983–2001	0.510	0.807	1.180
	38526	9752695	Vieques Island, PR	18.09	−65.47	0.225	0.190	2.4	1983–2001	0.509	0.807	1.179
	38525	9755371	San Juan, PR	18.46	−66.12	0.481	0.191	2.4	1983–2001	0.519	0.814	1.189
	38165	9759110	Magueyes Island, PR	17.97	−67.05	0.204	0.157	1.9	1983–2001	0.508	0.806	1.178
	38524	9759938	Mona Island, PR	18.09	−67.94	0.247	0.257	2.4	1983–2001	0.510	0.807	1.180

Section A2: Methods Appendix: Extreme Water Levels and Alaska Coastal Flood Height

A2.1: Data and Regional Frequency Analysis

A regional frequency analysis (RFA) of NOAA tide gauges is used to estimate extreme water levels (EWLs) along U.S. coastlines at and away from tide gauges. The RFA method (Hosking and Wallis, 1997) is based on the assumption that similar physical forcing across a region will produce a similar frequency of events and a probability density up to a local index (u), which is a local scaling factor that captures response peculiarities (Dalrymple, 1960). An RFA uses regional sets of data that have been locally normalized by their respective local index with a statistical heterogeneity test (H value) to assess the extent that the data are sufficiently similar. Using statistical L-moments, heterogeneity is a measure of the variation between sites of a location's summary distribution statistics and the amount of dispersion expected if the locations were indeed a homogeneous region (Hosking and Wallis, 1997). If $H < 1$, the region is considered acceptably homogeneous. If $1 \leq H < 2$, the region is considered possibly heterogeneous but acceptable for our study. If $H \geq 2$, then the tide-gauge group is definitely heterogeneous and not suitable for analysis. Once the regional bounds are established whose data are acceptably homogeneous, the aggregated data are fit with an extreme value distribution.

This study uses hourly and "top ten" data from all NOAA tide gauges[46] with at least 10 years of record (Figure A2.1). Water levels are put onto the mean higher high water (MHHW) tidal datum and detrended (the trend value is retained and shown in Table A1.3) relative to the midpoint of the current national datum tidal epoch (1983–2001), which is similar for NOAA EWL procedures using a single-gauge analysis (Zervas, 2013; Extreme Water Levels[47]). From the datasets, daily highest water levels are picked and declustered at each tide gauge using a 4-day storm window to ensure event independence. The 98th percentile of the

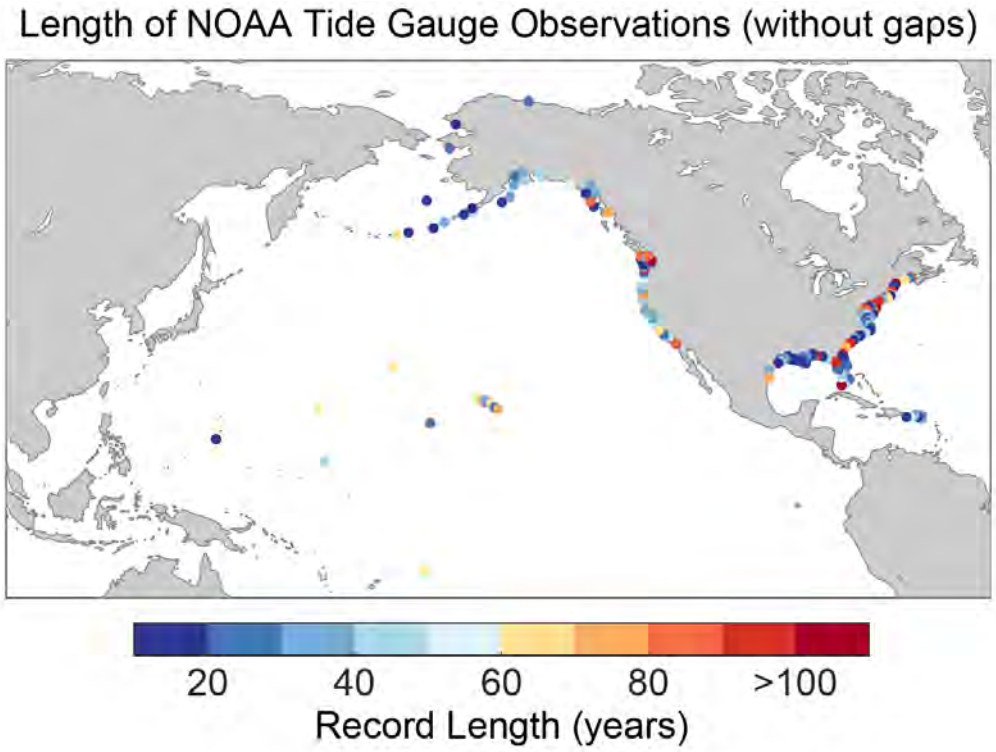

Figure A2.1: NOAA tide gauges used in the regional frequency analysis to generate extreme water level probabilities for U.S. coastlines.

[46] https://tidesandcurrents.noaa.gov/
[47] https://tidesandcurrents.noaa.gov/est/

declustered daily highest levels at each tide gauge is used as the local index (u) to normalize the data for the RFA process.

To form regions, the tide-gauge data is aggregated across a 400 km radius, similar to methods of Hall et al. (2016) but from the midpoint of a continuous set of coastline-intersecting 1-degree grids instead of site-specific installations. A maximum of 10 and a minimum of 3 tide gauges are included for each grid. Next, the regional data are spatially declustered with an additional 4-day event (i.e., storm) window to ensure that only the maximum water level within a region is retained (keep only the highest peak water levels for a particular event). Then, the statistical heterogeneity measure is estimated to ensure that the grouped tide-gauge data are sufficiently homogeneous (H < 2). In some instances, when a region surrounding a grid centroid

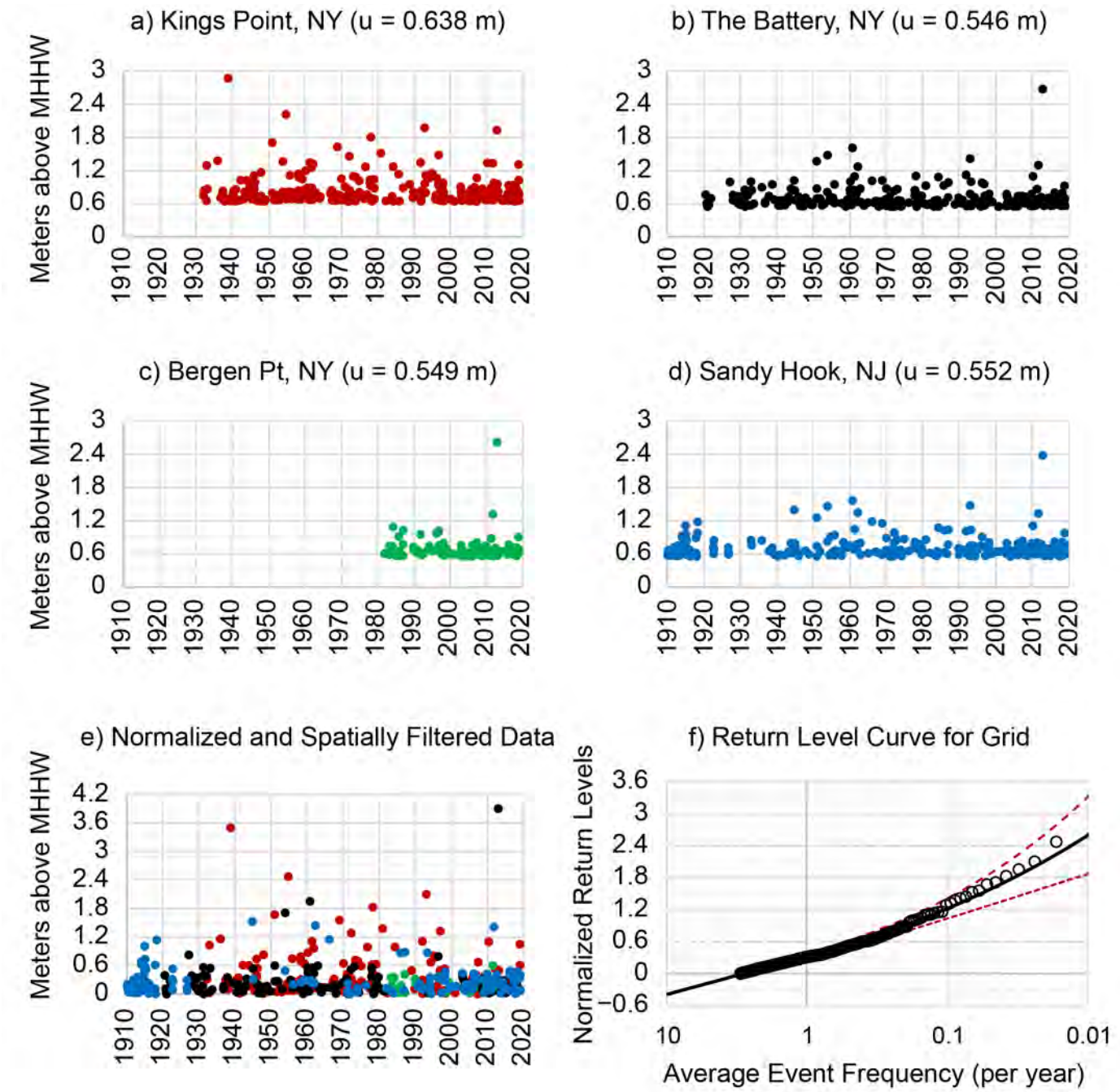

Figure A2.2: Example of data from grid number 46415 showing exceedances above each local index (u) relative to the 1983–2001 mean higher high water (MHHW) tidal datum at a) Kings Point, New York; b) The Battery, New York; c) Bergen Point, New York; and d) Sandy Hook, New Jersey, which are e) aggregated into a single dataset and f) fit by a Generalized Pareto Distribution to form a return level interval curve for the grid.

has H ≥ 2, tide gauges farthest away are sequentially dropped until homogeneity is achieved. In the end, all 1-degree grids along the contiguous United States (CONUS) had H < 2 (considered acceptably homogeneous) except a grid (number 48519) along the Northwest Pacific coastline, which, along with the Hawaiian and other U.S. Pacific Islands, uses the much larger physical-process regions identified and quantified in Sweet et al. (2020b). Grids along the Alaska coastline are fairly well resolved by the RFA except along the western and northern coasts.

An example is shown for grid number 46415, which is where the NOAA tide gauge at The Battery in New York City (NYC) is located (Figure A2.2). Four tide gauges are included in this grid (Kings Point, New York; The Battery, New York; Bergen Point, New York; and Sandy Hook, New Jersey [Figure A2.2a–d]), and their data are considered homogeneous (H value of 0.32). After the 4-day spatial filtering for events, each of the tide-gauge datasets is normalized by (divided by) its respective local index (u) value and aggregated as shown in Figure A2e.

A2.2: Gridded (Regional) Extreme Water Level Probabilities

With the tide gauges identified for each 1-degree grid, the aggregated and normalized datasets are fit with a Generalized Pareto Distribution (GPD; Coles, 2001). Using the penalized maximum likelihood method (Coles and Dixon, 1999; Frau et al., 2018; Sweet et al., 2020b), expected and 95% confidence interval (2.5th% and 97.5th% levels) values are estimated for the gridded EWL probabilities and defined as:

1)
$$G\,(Z;\,u,\alpha,\xi)\;=\;\lambda\left[1+\xi\left(\frac{z-u}{\alpha}\right)\right]^{-1/\xi}$$

where G is the exceedance probability (P[Z > z]), λ is the probability of an individual (normalized) observation exceeding the local index (u), α is the scale parameter, and ξ is the shape parameter. It is assumed that the distribution of the number of exceedances per year follows a Poisson distribution and that the return level for an EWL of height (Z) is given by:

2)
$$Z_N = u + \frac{\alpha}{\xi}\left[\left(Nn_y\lambda\right)^{\xi} - 1\right]$$

where N is the average recurrence interval (referred to in this study as the average event frequency, which is the reciprocal value), n_y is number of days per year (365.25), and λ is the average number of event exceedances per year (about 3 on average across all tide gauges in the study). To estimate EWLs with return levels with a 10 events/year frequency, we extrapolate the gridded GPD model with a logarithmic fit for return levels between the 0.5–3 events/year frequencies. A return level interval curve fit to the aggregated data (Figure A2.2e) for the grid where NYC is located is shown in Figure A2.2f.

A2.3: Localized Extreme Water Level Probabilities

When fitting a GPD to the RFA of aggregated tide-gauge data, the local EWL (EWL_{local}) probabilities including the model of expected values and their 95% confidence interval at a particular location are given as

3)
$$EWL_{local} = EWL_{gridded} * u_{local} + u_{local}$$

where $EWL_{gridded}$ is the gridded return level for a particular coastal 1-degree grid and u_{local} is the local index used in both the RFA and GPD processes. The value of u is a height (98th percentile of 4-day event filtered daily highest water level) above the local MHHW tidal datum for the current (1983–2001) national tidal datum epoch (NTDE) or for a modified 5-year epoch. The associated uncertainty of the $EWL_{gridded}$ estimated during the RFA is expressed as $\sigma_{gridded.}$ When localized at a tide gauge used in the formulation of the grids (see Figure A1), u is assumed to have no uncertainty. However, just as the location parameters in generalized extreme value (GEV) have time-dependent characteristics (Menéndez and Woodworth, 2010), it is recognized that u would experience similar behavior, but that is not quantified in this study.

In this RFA framework, it is possible to estimate EWL_{local} from the $EWL_{gridded}$ probabilities (expected values and 95% confidence interval) through the use of other sources of data. Specifically, the local indices needed to localize the $EWL_{gridded}$ values can either be 1) obtained from short-term tide-gauge data (or by targeted deployments) within a particular grid that is not included in the RFA formulation (<10 years; Figure A2.3) or 2) based on an underlying relationship between regional sets of local index (u) values and tide range available from, for example, NOAA VDatum.[48] In both cases, we establish large U.S. coastal regions (note: these are slightly different than the regions discussed in Sections 2 and 3 of the report and shown in Figure A1.1) that encompass several 1-degree grids to quantify information needed to obtain local indices and/or estimate variance/uncertainties (e.g., RMSE). These alternative methods, which are discussed below, may be of interest to coastal communities that are not co-located to a tide gauge used in this study but have predictions of tide range or have access to or are planning temporary tide-gauge installations to establish tidal datums and/or EWLs.

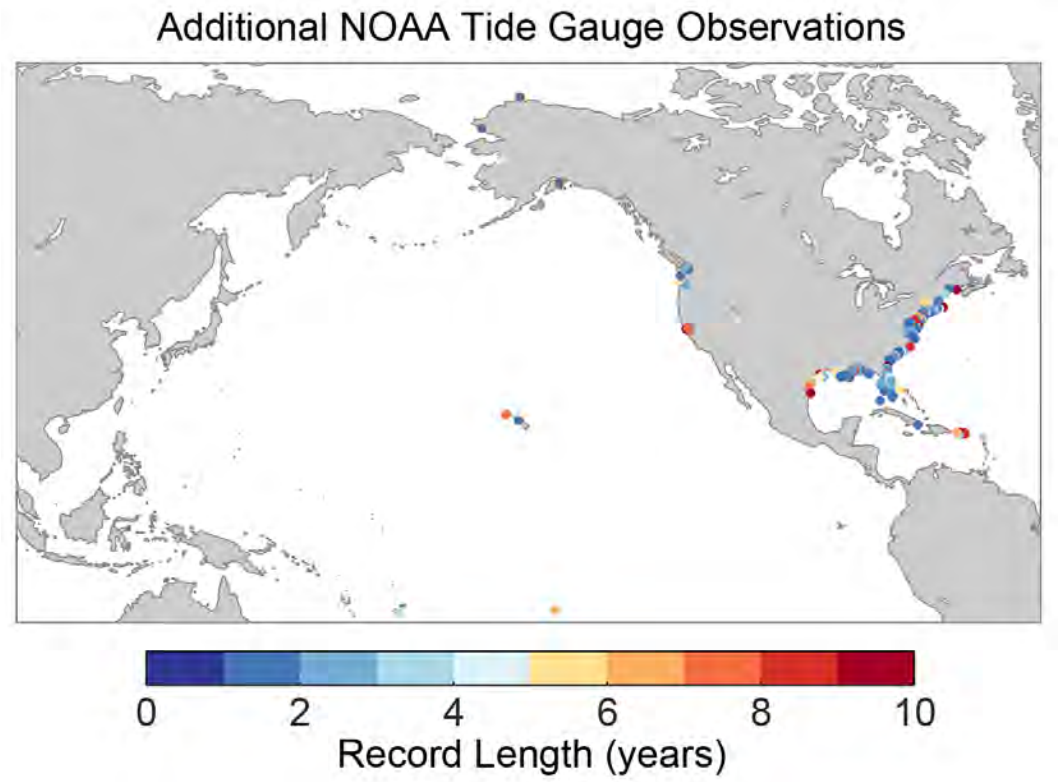

Figure A2.3: Additional tide-gauge data available from NOAA that can be used to localize the 1-degree gridded set of regional frequency analysis-based extreme water level probabilities. See https://tidesandcurrents.noaa.gov/.

A2.3.1: Local Index Estimates from Short-Term Installations

When other sets of tide/water level data are available, a local index can be directly estimated to obtain EWL_{local} probabilities from the $EWL_{gridded}$ probabilities. The first step for using data that are not from NOAA would be to estimate a local MHHW tidal datum using, for example, NOAA's online datum tool.[49] Following Equation 3 above, there will be some uncertainty in the local index value that is dependent on record length (e.g., 1–10 years). To account for short-record uncertainty in the local indices (u), RMSE (1 standard error) is estimated for regional estimates of u for the tide gauges used in the RFA (see Figure A2.1). Root mean square error is estimated using a logarithmic fit over a 19-year record length (Figure A4). To compute the RMSE, the maximum absolute differences are computed between u derived over the entire record and for progressively longer consecutive record lengths between 2001 and 2019 at each tide gauge (e.g., 19 discrete 1-year

[48] https://vdatum.noaa.gov/
[49] https://access.co-ops.nos.noaa.gov/datumcalc/

records; 18 consecutive 2-year records). The maximum (absolute) difference is used to account for interannual variability that can be significant (e.g., during phases of El Niño–Southern Oscillation [ENSO]). This difference is considered the error in estimating u for shorter records, and the average of the absolute differences across the regional set of tide gauges is considered the bias. The standard deviation of the absolute differences is also computed across all tide gauges, and an estimate of the RMSE is then computed as the square

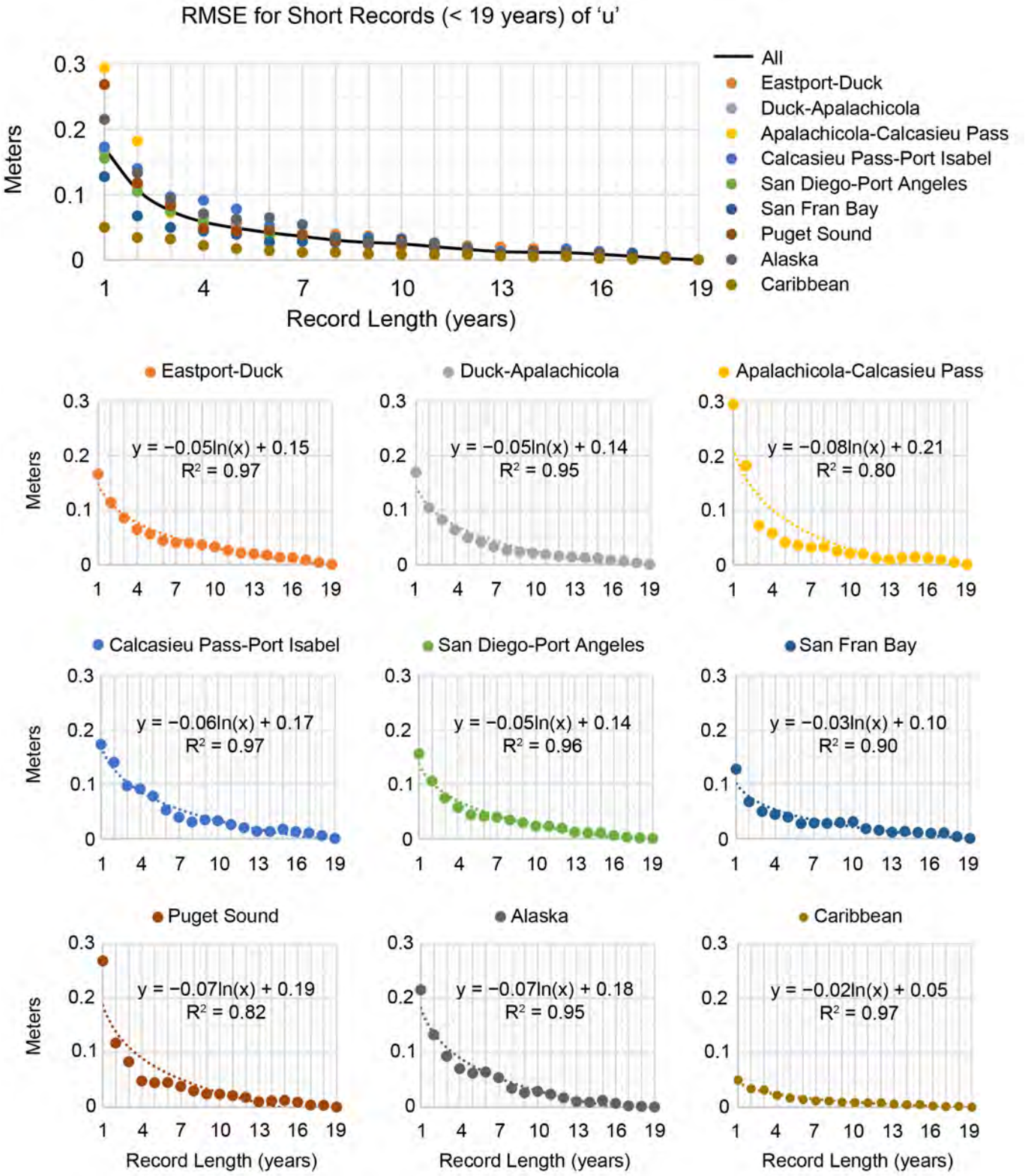

Figure A2.4: Root mean square error for regional estimates of flood indices (u) based on 1–19 years of consecutive data over the 2001–2019 period, based on regional sets of tide gauges used in this study. Note: these regions are not the same as those shown in Figure A1.1 and used to describe results in Sections 2 and 3 of the report.

root of the sum of the square of the bias and the standard deviation (variance). The estimates for Hawaiian and U.S. Pacific Islands follow estimates of Sweet et al. (2020b).

A2.3.2: Obtaining a Local Index from Tide Range Information

Another method to obtain an estimate of a local index (u) and its uncertainty is based on a dependency (correlation) that exists with tide range (great diurnal [GT]) along most coastal regions similar to findings of Merrifield et al. (2013). In essence, tide range (GT), which represents the spread between MHHW and mean lower low water (MLLW), partially quantifies the variance of the daily highest water level distribution and the height of the local index u. Figure A2.5 illustrates the regression-based relationships between tide range and u along U.S. coastal regions (these are the same regions used in Figure A2.4). All regressions are significant above the 90% significance level (p values < 0.1) and applicable for the 1983–2001 tidal epoch. For the Hawaiian and U.S. Pacific Islands, the Pacific-wide regression of Sweet et al. (2020b) is used.

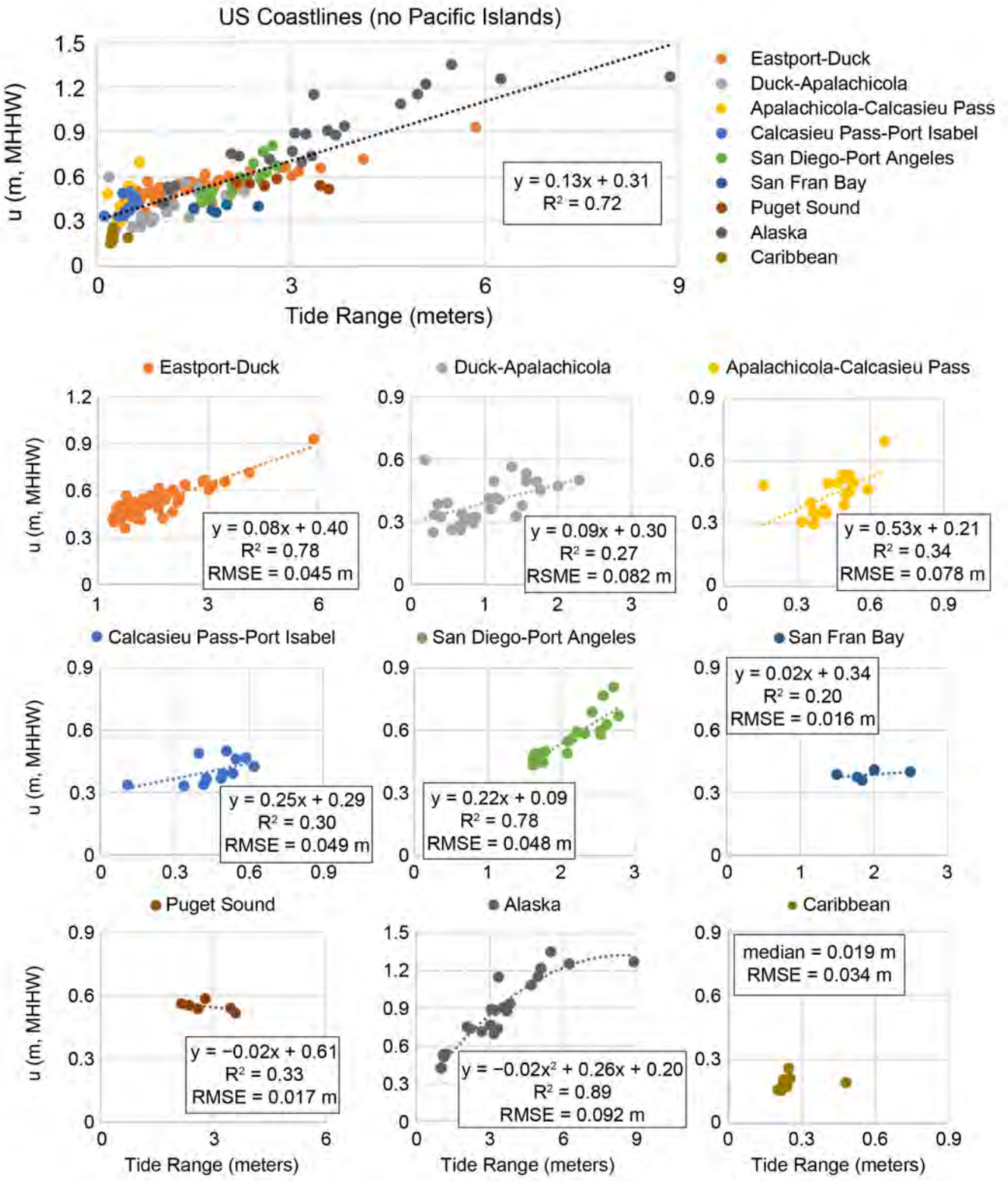

Figure A2.5: Tide range to local index (u) regressions with equations, goodness of fit (R^2), and root mean squared error (RMSE) shown by regions. Note: all local indices (u) are relative to the 1983–2001 tidal datum epoch. In the equations, y represents the local index (u) and x represents tide range.

A2.3.3: Uncertainties Using Alternative Methods to Estimate EWL_{local} Probabilities

When using either alternative method (tide range or short-record estimates) to obtain a local index (u), the uncertainty estimates of EWL_{local} probabilities will include additional uncertainty in u (σ_u). Following methods of Sweet et al. (2020b), it can be shown that

4) $$\sigma_{EWL(local)} = [(1 + \mu_{EWLgridded})^2 + \sigma^2_{EWLgridded}]\sigma_u^2 + \mu_u^2\sigma^2_{EWLgridded}$$

where $\mu_{EWLgridded}$ and μ_u are the expected values of the gridded return levels and the expected value of u, for example, estimated by the tide-range and u dependency (see Figure A2.5), respectively, σ_u^2 is the uncertainty inherent to any u-prediction relationship (e.g., RMSE). Thus, there is an additive uncertainty in u as estimated from this relationship, which would introduce additional uncertainty in estimates of EWL_{local}.

A2.3.4: Adjusting Local Extreme Water Level Probabilities to Time Periods

To adjust the EWL_{local} probabilities to a different sea level other than the current tidal epoch (e.g., from 1992 to 2000 or 2005 so as to apply the sea level rise scenarios), RSL estimates using the trends inherent to the hourly data used to compute the local index (u) should be applied (Table A1.3) to the epoch-specific EWL_{local} probabilities themselves. For tide gauges used in the RFA analysis and with more than 20 years of data, the local u trend can be used; otherwise, a median regional trend as defined in Figures A2.4 and A2.5 can be used. Alternatively, the RSL offsets derived from the regional observational RSL data (Table A1.2) could be used with differences between methods considered insignificant. For example, to estimate probabilities for the year 2000, the EWL_{local} probabilities values would be increased by an amount equal to the trend in u (or the median u trend value for the region) multiplied by 8 years (since 1992, which is the midpoint of the 1983–2001 epoch). The same procedure should be followed to adjust EWL_{local} probabilities for a given location estimated via the tide range regression (see Figure A5). In the case of a short-term estimate of u, similar procedures should be followed if local tidal datums have been computed and adjusted to the national tidal datum epoch (e.g., using the CO-OPS Tidal Analysis Datum Calculator[50]); in the case where no epoch can be established (see the CO-OPS Tidal Analysis Datum Calculator for guidance), then the measurements will be assumed to be referenced to the period of collection, and trend adjustment may be less straightforward.

A2.4: Alaska Coastal Flood Heights

To assess flood exposure, the coastal high tide flooding (HTF) heights of Sweet et al. (2018) are used for all U.S. coastlines outside of Alaska. Used in NOAA annual outlooks (e.g., Sweet et al., 2021; The State of High Tide Flooding and Annual Outlook[51]), these heights are a best-fit solution (regression) to the dozens of National Weather Service (NWS) emergency response warning thresholds established at many (but not all) NOAA tide gauges along the country's coastline. The NWS thresholds are used to communicate expected or ongoing coastal flood hazards to the public (NOAA, 2020), but often their depth-severity thresholds vary according to specific features near the tide gauge that affect both the associated flood frequency and the degree of broader vulnerabilities. Along the Alaska coastline, we follow the methodologies of Sweet et al. (2020b), who used a slight modification to assess "damaging flood heights" for the Pacific Basin coastlines. Here, the Alaska flood heights are based on a quadratic regression model using only Pacific Coast NWS minor flood heights and considered for only tide ranges below 6 meters (Figure A2.6a). To obtain moderate and major flood heights for Alaska, 0.3 m and 0.7 m are added to the regression, which is approximately the median difference between these heights and those for minor flooding along CONUS (Sweet et al., 2018). With flood heights defined nationally, minor, moderate, and major HTF are defined as occurring when water levels reach or exceed heights of about (median values) 0.55 m, 0.85 m, and 1.2 m above MHHW, respectively, and linearly vary with tide range (Figures A2.6b–d).

[50] https://access.co-ops.nos.noaa.gov/datumcalc/index.jsp
[51] https://tidesandcurrents.noaa.gov/HighTideFlooding_AnnualOutlook.html

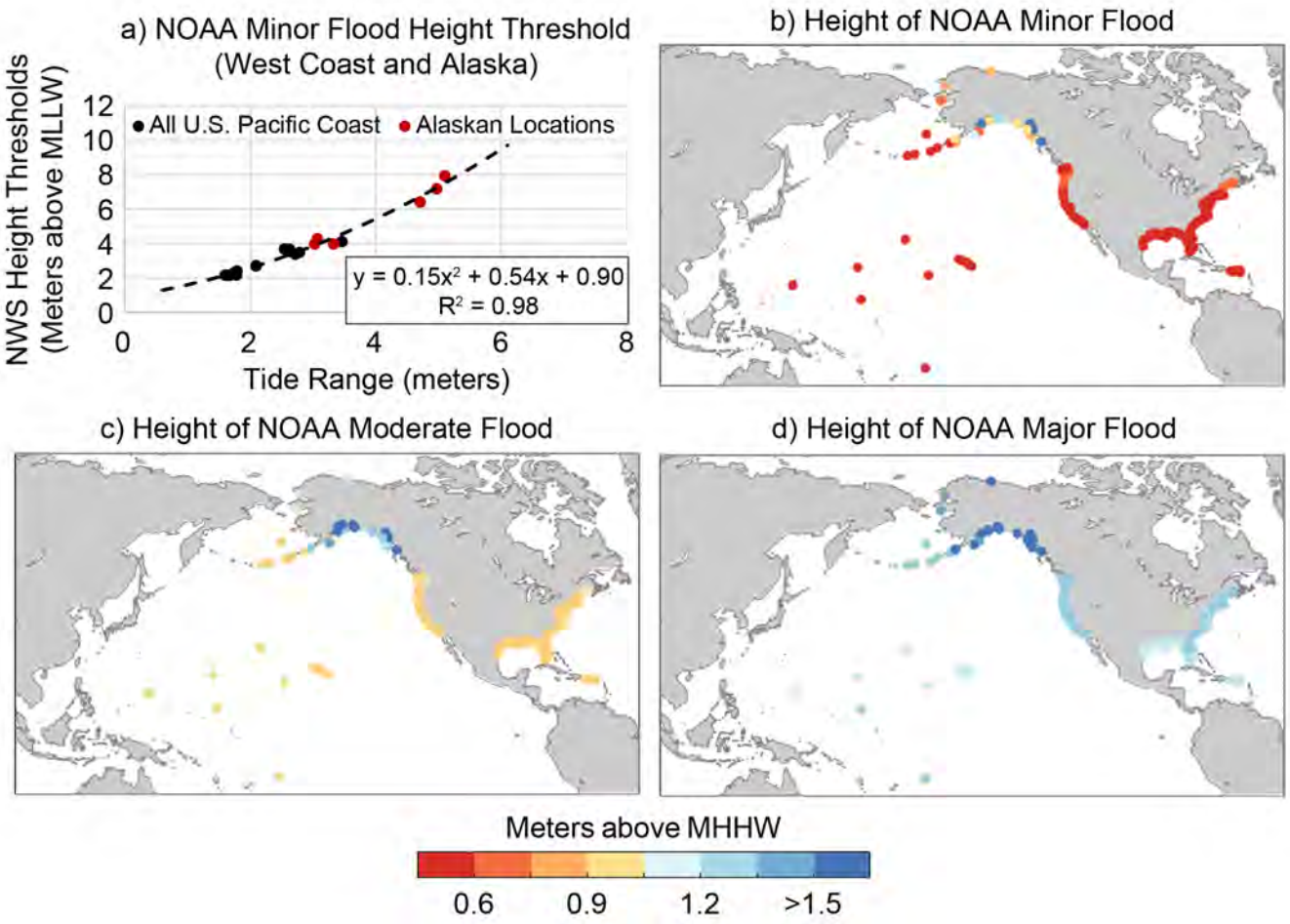

Figure A2.6: a) Quadratic regression of U.S. West Coast minor flood heights of NOAA's National Weather Service, following methods of Sweet et al. (2020b), to obtain a minor HTF definition for Alaska's coastline. The NOAA flood heights for b) minor, c) moderate, and d) major HTF are shown relative to mean higher high water.

8. Acronyms

Note: state abbreviations have been omitted

AIS: Antarctic ice sheet
AEF: average event frequency
AMOC: Atlantic meridional overturning circulation
AR5: [IPCC] Fifth Assessment Report
AR6: [IPCC] Sixth Assessment Report
ARI: average return interval
C: celsius
CDF: cumulative distribution function
cm: centimeter
CMIP5: Coupled Model Intercomparison Project Phase 5
CMIP6: Coupled Model Intercomparison Project Phase 6
CONUS: contiguous United States
CO-OPS: Center for Operational Oceanographic Products and Services
CoSMoS: Coastal Storm Modeling System
DRSL: Department of Defense Regional Sea Level [database]
ENSO: El Niño–Southern Oscillation
EPA: Environmental Protection Agency
EWL: extreme water level
FEMA: Federal Emergency Management Agency
FFRD: Future of Flood Risk Data
GCM: global climate model
GEV: generalized extreme value
GHG: greenhouse gas
GIA: glacial isostatic adjustment
GlacierMIP: Glacier Model Intercomparison Project
GMSL: global mean sea level
GPD: Generalized Pareto Distribution
GPS: Global Positioning System
GRD: gravitational, rotational, and deformational
GT: great diurnal tide range
HTF: high tide flood, flooding
HUC: hydrologic unit code
InSAR: Interferometric Synthetic Aperture Radar
IPCC: Intergovernmental Panel on Climate Change
ISMIP6: Ice Sheet Model Intercomparison Project for CMIP6
JPM–OS: joint probability method–optimal sampling [procedure]
LARMIP-2: Linear Antarctic Response Model Intercomparison Project [version 2]
m: meter
MHHW: mean higher high water
MICI: marine ice cliff instability
MLLW: mean lower low water
mm: millimeter
NASA: National Aeronautics and Space Administration
NAVD88: North American Vertical Datum of 1988
NCA: National Climate Assessment
NCA5: Fifth National Climate Assessment
NCA4: Fourth National Climate Assessment
NOAA: National Oceanic and Atmospheric Administration
NOC: National Ocean Council

NSRS: National Spatial Reference System
NTDE: national tidal datum epoch
NWS: National Weather Service
NYC: New York City
PDO: Pacific Decadal Oscillation
R^2: goodness of fit
RFA: regional frequency analysis
RMSE: root mean square error
RSL: relative sea level
SOST: Subcommittee on Ocean Sciences and Technology
SSP: Shared Socioeconomic Pathway
USACE: U.S. Army Corps of Engineers
USGCRP: U.S. Global Change Research Program
USGS: U.S. Geological Survey
VDatum: Vertical Datum Transformation
VLM: vertical land motion


NOAA
NASA
US Army Corps of Engineers
USGS
science for a changing world
RUTGERS
UNIVERSITY | NEW BRUNSWICK
FEMA
FIU
Institute of Environment
Florida International University

EARTHJUSTICE

December 23, 2022

Electronically Submitted & Emailed

Governor Josh Green, M.D.
State of Hawai'i
https://governor.hawaii.gov/contact-us/contact-the-governor

Genevieve Sullivan
Department of Transportation, Highways Division—Planning Branch
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Honoapi'ilani Highway Improvements
https://www.honoapiilanihwyimprovements.com/#stay-involved

Re: Honoapi'ilani Improvements, West Maui, Ukumehame to Launiupoko—EIS Preparation Notice

Dear Governor Green, Ms. Sullivan, and Mr. Yoshioka,

Earthjustice hereby submits public comments on the proposed Honoapi'ilani Highway Improvements, West Maui, Ukumehame to Launiupoko ("Project"), for which an Environmental Impact Statement Preparation Notice ("EISPN") was published in The Environmental Notice on November 23, 2022. As discussed below, federal and state law require that environmental review for the Project analyze the growth-inducing impacts of realigning and widening Honoapi'ilani Highway, including the potential for the Project to facilitate development along the new transportation corridor.

Background

In November 2015, notice of a final environmental impact statement ("FEIS") for the Olowalu Town Master Plan ("Olowalu Plan") was published in The Environmental Notice.[1] The FEIS

[1] Office of Environmental Quality Control, *The Environmental Notice* (Nov. 8, 2015) at 6-7, which can be viewed at https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2015-11-08-TEN.pdf (last visited Dec. 21, 2022).

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ATTACHMENT E

was prepared pursuant to the Hawai'i Environmental Policy Act ("HEPA"), Hawai'i Revised Statutes ("HRS") chapter 343 by Olowalu Town, LLC, and Olowalu Ekolu, LLC. The Olowalu Plan proposed development of approximately 1,500 new single-family and multi-unit homes and associated infrastructure over a period of ten years.[2]

Earthjustice submitted testimony to the accepting agency—the Hawai'i Land Use Commission—urging the Commission to reject the FEIS for numerous legal flaws, including that because the Olowalu Plan appeared to be dependent upon the Hawai'i Department of Transportation's ("HDOT's") and the Federal Highway Administration's ("FHA's") plans to realign the Honoapi'ilani Highway, the FEIS should be coordinated with or include the environmental review documents that were being prepared for the proposed highway realignment.[3] At a public meeting before the Commission that included two full days of public testimony, the Project faced "fierce opposition" from a groundswell of community members.[4] Public opposition included concerns about further offshore degradation caused by construction runoff. Moreover, the Hawai'i Office of Planning opposed the project due to the FEIS's lack of a complete traffic impact analysis report.

The Commission voted 6-to-1 in favor of rejecting the FEIS.[5] The Commission noted that the FEIS's traffic impact assessment report was based on widening the Honoapi'ilani Highway, but it was unclear whether HDOT's and FHA's highway realignment project would involve widening.[6]

Seven years later, HDOT and FHA have resumed plans to realign the Honoapi'ilani Highway, including near Olowalu Town. Although one of the EISPN's stated objectives is to have "sufficient right-of-way width to accommodate a future four-lane facility throughout the project limits," the EISPN makes no mention of how any of the realignment routes and road widening under consideration could impact growth and development, including in Olowalu Town.

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[2] FEIS at 9. Volume I of the FEIS can be viewed at https://luc.hawaii.gov/wp-content/uploads/2015/10/FEIS-Vol-I-of-IV.October-2015_Part1.pdf (last visited Dec. 20, 2022).

[3] *See* Attachment: Earthjustice written testimony (Nov. 18, 2015) at 2, 5.

[4] *Olowalu town development faces fierce opposition*, Maui News (Nov. 19, 2015), https://www.mauinews.com/news/local-news/2015/11/olowalu-town-development-faces-fierce-opposition/ (last visited Dec. 20, 2022).

[5] Land Use Commission Meeting Minutes (Dec. 7, 2015) at 13. The LUC's meeting minutes can be viewed at https://files.hawaii.gov/luc/minutesofmtgs/2015/12072015kahului.pdf (last visited Dec. 20, 2022).

[6] Findings of Fact, Conclusions of Law, and Decision and Order Denying the Acceptance of a Final Environmental Impact Statement (Dec. 11, 2015) at 14. The LUC's Order can be viewed at (https://luc.hawaii.gov/wp-content/uploads/2015/10/A10-786-FOF-COL-DO-DENY-FEIS-ORDR.pdf (last visited Dec. 20, 2022).

The EIS Should Consider the Growth-Inducing Effects of Project Alternatives

The EISPN acknowledges that HDOT, in cooperation with FHA, will prepare for the Project a joint environmental impact statement ("EIS") under both the federal National Environmental Policy Act ("NEPA") and HEPA. Therefore, both NEPA and HEPA requirements apply to the Project. *See* Haw. Admin. R. § 11-200.1-31(5). Under both statutes, the EIS for the Project must analyze the growth-inducing indirect effects of facilitating development or other changes in the pattern of land use caused by increasing traffic capacity through the Project area and realigning the highway mauka. The EIS must specifically consider how realigning and widening the highway would allow for development in Olowalu Town along the lines of the development considered in the Olowalu Plan FEIS, discussed above.

NEPA regulations define "indirect effects" to include "growth inducing effects and other effects related to induced changes in the pattern of land use, population density and growth rate, and related effects" on the environment. 40 C.F.R. § 1508.1(g)(2). Where transportation infrastructure expansions have the potential to create additional demand, "agencies must analyze the impacts of the increased demand attributable to the [infrastructure project] as growth-inducing effects falling under [NEPA's] purview." *Barnes v. U.S. Dep't of Transp.*, 655 F.3d 1124, 1139 (9th Cir. 2011). In *Barnes*, the Ninth Circuit considered the "unique potential to create demand" presented by construction of an additional runway at an Oregon airport and concluded that NEPA required the EIS for the runway expansion to analyze growth-inducing indirect impacts "even if the stated purpose of the project is to increase safety and efficiency." *Id*. HDOT's proposed realignment of Honoapi'ilani Highway, which would double traffic capacity from two to four lanes in the project area,[7] and could facilitate development makai of the realigned highway, has the potential to create demand for residential and commercial development along the widened, realigned route, including in Olowalu Town. These potential growth-inducing effects should be analyzed in the Project's EIS.

Using language nearly identical to that in the NEPA regulations, HEPA's administrative rules also require analysis of indirect effects (also termed "secondary effects" or "secondary impacts"). Haw. Admin. R. § 11-200.1-2; *see also Kia'i Wai v. Dep't of Water*, 151 Hawai'i 442, 455, 517 P.3d 725, 738 (2022). In *Kia'i Wai*, the Hawai'i Supreme Court addressed the HEPA review process for a new water main that would substantially increase water transmission capacity and potentially lead to increased water use. *Id.* at 456, 517 P.3d at 739. The Court held that because the increased pipeline capacity would "facilitate additional water use," HEPA required analysis of these "reasonably foreseeable" additional uses. *Id.* at 458, 517 P.3d at 741. Citing *Barnes*, the Court observed that "the relief line upgrade [was] akin to replacing a two-lane road with a four-lane highway: even if the old road needed to be fixed anyway, that does not change the fact that the new highway adds additional capacity, nor does it alleviate the environmental impacts of the upgrade." *Id.* at 459, 517 P.3d at 742. Thus, HEPA requires HDOT to analyze the reasonably foreseeable growth-inducing effects of doubling traffic capacity through the Project area and realigning the highway mauka, including the potential for additional residential and

[7] EISPN at 13, 15.

commercial development along the expanded and realigned transportation infrastructure, such as in Olowalu Town.

In sum, under NEPA and HEPA, the scope of environmental review for the Project should encompass the indirect effects of realigning and widening Honoapi'ilani Highway, including the potential for the Project to induce growth and facilitate development, for each of HDOT's proposed alternatives. Please don't hesitate to contact me at mcleveland@earthjustice.org if you have any questions or would like to discuss this further.

Respectfully submitted,

/s/ Mahesh Cleveland
MAHESH CLEVELAND
Earthjustice

Attachment:

Earthjustice Testimony on Behalf of Maui Tomorrow Foundation Regarding the Final Environmental Impact Statement for the Olowalu Town Master Plan (Nov. 18, 2015)

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, D.C. INTERNATIONAL

EDMUND ACZON, CHAIR
JONATHAN LIKEKE SCHEUER, VICE-CHAIR
STATE OF HAWAI'I LAND USE COMMISSION

TESTIMONY ON BEHALF OF MAUI TOMORROW FOUNDATION
REGARDING THE FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE OLOWALU TOWN MASTER PLAN (DKT. NO. A10-786)

November 18, 2015 – 9:30 a.m.
Maui Arts & Cultural Center, Haynes Meeting Room

Aloha Chair Aczon and Commissioners:

My name is Summer Kupau-Odo, and I am an attorney in the Mid-Pacific office of Earthjustice, a national, non-profit, public interest environmental law firm. The Mid-Pacific office has been offering pro bono legal services in Hawai'i for over twenty-five years, and has represented dozens of environmental, Native Hawaiian, and community organizations in enforcing environmental laws. Earthjustice submits this testimony on behalf of its client Maui Tomorrow Foundation, and respectfully urges you to reject the final environmental impact statement submitted for the Olowalu Town Master Plan (FEIS).

The FEIS has numerous content inadequacies, which Maui Tomorrow Foundation and other concerned community groups and individuals will address. The scope of this testimony addresses a procedural violation of Hawai'i's environmental review laws: the absence of federal agency cooperation in the preparation of the FEIS.

The FEIS does not satisfy at least one of the three criteria for acceptability enumerated in Hawai'i Administrative Rule (HAR) § 11-200-23(b)(1). Pursuant to this rule, before this Commission may deem the FEIS acceptable, it must find that "[t]he procedures for . . . the preparation and submission of the statement . . . have all been completed satisfactorily as specified in [HAR chapter 11-200.]" HAR § 11-200-25(1) requires that when an action is subject to both the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq*., and the Hawai'i Environmental Policy Act (HEPA), Hawai'i Revised Statutes (HRS) chapter 343, the applicant "shall notify the responsible federal agency, the [Office of Environmental Quality Control], and any agency with a definite interest in the action (as prescribed by chapter 343, HRS) of the situation." Additionally, the same rule requires state agencies, such as this Commission, to "cooperate with federal agencies to the fullest extent possible to reduce duplication between federal and state requirements[,] . . . [including the preparation of] joint environmental impact statements with concurrent public review and processing at both levels of government." HAR § 11-200-25(2); HRS § 343-5(h) (requiring same).

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As discussed in further detail below, the Olowalu Town Master Plan is subject to several federal laws, and is dependent on federal actions that trigger environmental review under NEPA. Yet, there has been no coordination with federal agencies in the preparation of the EIS. The Olowalu Town FEIS is the product of a deficient process that violates HAR § 11-200-25, and, accordingly, this Commission cannot deem it acceptable pursuant to HAR § 11-200-23(b)(1).

The Olowalu Town Master Plan is Subject to Federal Environmental Review Under NEPA

A federal Clean Water Act permit is required.

Based on information in the FEIS, the Olowalu Town Master Plan cannot be implemented without a federal permit issued by the Army Corps of Engineers (the Army Corps or Corps), to discharge dredged or fill material into waters of the U.S., pursuant to section 404 of the Clean Water Act, 33 U.S.C. § 1344. On July 9, 2010, the Army commented on the environmental impact statement preparation notice and advised the applicant to submit a request for an approved jurisdictional determination for water bodies that fall within the project area (FEIS Vol. I). Robert Hobdy was commissioned to prepare an Aquatic Resource Survey, dated May 2011 (FEIS Vol. IV Appendix F1). Utilizing the Corps' approved jurisdictional determination form, Hobdy concluded that six aquatic features within the project area—Olowalu Stream, Kapa'iki Village Drainage Channel, Kapa'iki Fishpond, and three unnamed tributaries—constitute waters of the U.S. Based on Hobdy's analysis, before any of these areas can be dredged or filled, the applicant must obtain a section 404 permit. *See* 33 U.S.C. §§ 1311, 1344 (prohibiting the discharge of dredged or fill material into waters of the U.S. without a permit).

The Olowalu Town Master Plan proposes to construct a 160-foot wide bridge crossing at Olowalu Stream (FEIS p. 234), as part of a larger plan to relocate the Honoapi'ilani Highway mauka of its current location and through the applicant's land. Building such infrastructure in a water of the U.S. constitutes a discharge of fill material requiring a permit. *See* 33 C.F.R. § 323.2(f) ("The term discharge of fill material . . . generally includes . . . [p]lacement of fill that is necessary for the construction of any structure or infrastructure in a water of the United States; the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction . . . .").

Overall, the Olowalu Town Master Plan proposes construction of 1,500 residential dwelling units, including houses, apartments, townhouses, cottages, farmsteads, in addition to stores, schools, parks, community centers, and all of the necessary infrastructure to support these improvements, including roadways, drainage systems, and a wastewater treatment facility with constructed wetlands. The applicant anticipates these construction activities will extend across 434 acres of the approximately 636 acres of the project site. (Carlsmith Ball letter, dated Nov. 9, 2015, p. 3.) Comparing the conceptual master plan map for alternative 1 in Figure

4 of the FEIS with the maps in Hobdy's reports showing the locations of the six jurisdictional waters, it appears the extensive construction under the master plan will occur across all six water bodies, not just Olowalu Stream. These construction activities will likely cause discharges of fill material into these waters. *See* 33 C.F.R. § 323.2(e)(2) ("Examples of such fill material include, but are not limited to: rock, sand, soil, clay, plastics, construction debris, wood chips, . . . and materials used to create any structure or infrastructure in the waters of the United States."). These activities may also cause discharge of dredged material, *i.e.*, "material that is excavated or dredged from waters of the United States." 33 C.F.R. § 323.2(c).

For instance, comparing Figure 4 with Hobdy's assessment of the Kapa'iki Fishpond, the Olowalu Town Master Plan proposes to remove the section of the Honoapi'ilani Highway that crosses the Kapa'iki Fishpond drainage pipe (which runs to the ocean). Such an extraction will likely cause the discharge of fill material, and, depending on what the applicant plans to do thereafter, possibly the discharge of dredged material, into the fishpond, as well as the ocean.

For all of these reasons, the applicant must secure a federal permit before commencing construction.

The need for a Section 404 permit triggers NEPA review.

The United States Court of Appeals for the Ninth Circuit has held that the issuance of a Section 404 permit constitutes a federal action triggering environmental review under NEPA. *See Save Our Sonoran, Inc. v. Flowers*, 408 F.3d 1113, 1121 (9th Cir. 2004) ("A section 404 permit issued by the Corps is a 'Federal action' to which NEPA applies."). This means that the Corps has an independent obligation to determine the potential impact of a project, and not just on the waters within the Corps' jurisdiction, but on the environment at large. *See id.* at 1122. *See also* C.F.R. Title 40, chapter V (Council on Environmental Quality NEPA regulations); C.F.R. Title 33, chapter II, part 230 (Army Corps procedures for implementing NEPA).

HEPA and NEPA Mandate Joint Cooperation with the Army Corps, and Likely the Federal Highway Administration, in the Preparation of the Olowalu Town EIS

Where both NEPA and HEPA apply to an action, joint cooperation among federal and state agencies is required.

NEPA's applicability to the Olowalu Town Master Plan invokes additional legal obligations for the applicant, as well as this Commission, in fulfilling the state EIS laws. Where an action is subject to both NEPA and HEPA, HEPA and its implementing regulations require state agencies, including this Commission, to cooperate with federal agencies to the fullest extent possible, including preparing joint environmental impact statements and conducting concurrent public review and processing at both levels of government. HRS § 343-5(h); HAR § 11-200-25(2). Similarly, NEPA's implementing regulations require federal agencies, including

the Army Corps, to cooperate with state and local agencies to the fullest extent possible, 40 C.F.R. § 1506.2(b), (c), including preparing joint environmental impact statements and holding joint public hearings, *id.* This process must begin at the earliest possible time. *Id.* § 1501.2(d)(3).

There has been no cooperation with the Army Corps in preparing the FEIS, and, therefore, the FEIS was produced in violation of state and federal law.

Under HEPA, the Applicant Must Notify the Army Corps of NEPA Applicability

HEPA places the onus on the applicant to notify the Army Corps that NEPA applies to its project. When NEPA applies to a private action, HAR § 11-200-25(1) requires the applicant to notify: (1) "the responsible federal agency"; (2) the Office of Environmental Quality Control (OEQC); and (3) "any agency with a definite interest in the action." The FEIS does not state the applicant notified any of these agencies of NEPA applicability. Instead, in its response to a comment from the state Department of Health, Clean Water Branch (letter dated October 26, 2015), the applicant states it will contact the Army Corps later, "[a]s the project progresses towards implementation." Later is too late; HAR § 11-200-25(1) requires the applicant to have contacted the Army Corps, OEQC, and other interested agencies long ago. *See id.* ("The applicant or agency, *upon discovery of its proposed action being subject to both chapter 343, HRS, and the National Environmental Policy Act*, shall notify the responsible federal agency, ... " (emphasis added).

Cooperation with the Federal Highway Administration is Likely Required.

The Olowalu Town Master Plan seeks to relocate a portion of Honoapi'ilani Highway mauka from its existing location, and to utilize parts of the remnant roadway as a "coastal roadway." (FEIS p. 234.) The FEIS estimates the cost of the highway relocation to be $18 million, and designates as an "unresolved issue," the applicant's total financial contribution for area roadway improvements. (FEIS p. 398.) What is not addressed in the FEIS is the extent of federal agency involvement in the highway realignment, and whether any federal funds will be used. These are critical facts that need clarification now, because federal assistance with the highway realignment is another trigger for federal environmental review under NEPA, thereby necessitating cooperation with an additional federal agency, the Federal Highway Administration (FHA). *See* 40 C.F.R. § 1508.18(b) ("Federal actions tend to fall within one of the following categories: . . . (4) Approval of specific projects, such as construction or management activities located in a defined geographic area. Projects include actions approved by permit or other regulatory decision as well as federal and federally assisted activities.").

Notably, the Honoapi'ilani Highway is already designated a "federal-aid highway,"[1] and currently, the state Department of Transportation (HDOT) and FHA are in the process of preparing a joint draft EIS for plans to realign, improve, and widen the highway from Mā'alaea to Launiupoko, which encompasses Olowalu. The FEIS references ongoing negotiations between the applicant and HDOT, and proposes to relocate and widen the highway through its lands "in conjunction with" HDOT's Mā'alaea to Launiupoko project. (FEIS p. 234.) Thus, it appears the Olowalu Town Master Plan is dependent on HDOT's plans. HDOT has apparently taken this view, stating, in its January 26, 2015 letter to the applicant (FEIS Vol. II), that it expected roadway improvements to be provided *prior to the issuance of a certificate of occupancy*. Legally, then, because a project that FHA is administering is a necessary part of the Olowalu Town Master Plan, the federal nexus for involving FHA in the environmental review process for the Olowalu Town Master Plan is present. *See* 40 C.F.R. § 1508.18; Lathan v. Brinegar, 506 F.2d 677, 693 (9th Cir. 1974) (requiring "full, fair bona fide compliance with NEPA" when reviewing an agency decision with respect to a federal-aid highway project).

In addition to being legally required, it makes good sense that the Olowalu Town EIS incorporate all information concerning environmental impacts of the HDOT highway project. As HDOT pointedly stated in its January 26, 2015 letter:

> It is recommended that Olowalu Town expand its environmental impact statement (EIS) to consider the Federal environmental efforts the HDOT is currently conducting for its preparation of the EIS for the Honoapiilani Highway Realignment Project from Launiupoko to Maalaea. The Olowalu Town's EIS should be consistent with HDOT's federal environmental documents in matters of alternative alignment analysis, historic and cultural preservation, and endangered species, etc.

This Commission simply cannot accept the FEIS knowing there is additional, material information already being compiled into an EIS through the joint efforts of another state agency and a federal agency, which, as discussed below, has presumably accessed the expertise of other federal agencies pursuant to obligations under the Endangered Species Act. As HDOT advises, the Olowalu Town EIS should, at minimum, include information from HDOT/FHA's Mā'alaea-Launiupoko EIS.

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[1] The Federal-Aid Highways 2035 Transportation Plan for the District of Maui (July 2014) designates the Honoapi'ilani Highway (Route 30) a "federal-aid highway" between Main Street (Wailuku) and Front Street (Lahaina). "Federal-aid highway" means "a public highway eligible for assistance under [Title 23 chapter 1 of the U.S.C.] other than a highway functionally classified as a local road or rural minor collector." 23 U.S.C. § 101(a)(6).

Subsequent Preparation of a Federal EIS Does Not Cure the FEIS's Illegality

Accepting the FEIS would deprive state and county decision makers of additional information that would be obtained through joint federal-state environmental review.

The Army Corps and FHA Must Comply with the Endangered Species Act

The FEIS notes the presence of four species in the project area listed under the Endangered Species Act (ESA): the endangered nēnē, the endangered hawksbill sea turtle, the endangered Hawaiian monk seal, and the threatened green sea turtle. (FEIS pp. 107-17.) The presence of these listed species triggers obligations under the ESA for the Army Corps and FHA before they can issue a Section 404 permit and offer federal assistance for the highway realignment.

Section 7(a)(2) of the ESA directs each federal agency to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. 16 U.S.C. § 1536(a)(2). If listed species or critical habitat units are present, the federal agency must determine if the proposed action may affect the species or habitats, in which case, the agency must initiate at least informal consultation with the U.S. Fish & Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS), to obtain their expertise in determining the action's impact on those species and habitats.

Under the ESA, the applicant cannot unilaterally determine whether the Olowalu Town Master Plan is likely to adversely affect listed species or critical habitat. Accepting the FEIS and prior to collaboration with the Army Corps and the FHA would deprive state and county decision makers of important information concerning endangered and threatened species.

The FEIS also does not adequately address the potential for a "take" of the four listed species found in the project area. Section 9 of the ESA makes it unlawful for any person to "take," that is, "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct[,]" any endangered species. 16 U.S.C. §§ 1532(19), 1538(1)(b). Section 10 of the ESA addresses situations in which projects may result in the incidental take of listed species, and provides for incidental take permits where the applicant develops and obtains approval of a habitat conservation plan. *See id*. § 1539.

In response to the Maui County Department of Planning's comment regarding the draft EIS's failure to discuss how water features might attract more nēnē to the area, the possibility of incidental "takes," and cooperation with the FWS (FEIS Vol. II, October 26, 2015 letter to William Spence, Director, Dept. of Planning p. 10), the applicant concluded, without any data or input from the FWS, that water features or irrigated parks in the master plan "are not dangerous to nene," and that these features "do not create a take.'" However, according to the

applicant's wastewater management plan prepared by Brown & Caldwell, the proposed location for the Honoapi'ilani Highway realignment is next to the 4.7 acres of soil aquifer treatment (SAT) basins and near to the constructed wetlands meant to attract birds. (FEIS Appendix Q pp. 1-3, 8-1 to 8-3 & Fig. 3.2.) The FEIS does not address whether the location of the highway next/near to water features within the project—the constructed wetlands, SAT basins, as well as the Olowalu Stream—will increase the potential for a "take" of nēnē.

The FEIS does not discuss the potential for incidental take of the three listed marine species at all.

This is an important topic that must be thoroughly discussed in the FEIS as a potential impact, and it raises the specter of liability under the ESA, for not just the applicant, but state agencies, including this Commission, that approve a private project that causes a "take" of listed species. This is all the more reason why cooperation in the preparation of the Olowalu Town EIS between the applicant, this Commission, and the Army Corps and FHA is imperative.

Federal Environmental Review is Required Now, at the Early Planning Stages

The fact that federal environmental review must occur before the Army Corps issues a Section 404 permit and before the FHA provides assistance with the Honoapi'ilani Highway realignment makes the FEIS legally deficient, and this will not be cured by future NEPA compliance. The timing of environmental review is key under both HEPA and NEPA. As the Hawai'i Supreme Court reaffirmed in the Koa Ridge case:

> [B]oth federal and state courts have recognized that environmental review must occur early enough to function practically as an input into the decision making process. In construing [NEPA], for example, the United States Court of Appeals for the Ninth Circuit cautioned that an assessment must be prepared early enough so that it can serve practically as an important contribution to the decision making process and will not be used to rationalize or justify decisions already made. . . . [T]he rationale behind this rule is that inflexibility may occur if delay in preparing an EIS is allowed: After major investment of both time and money, it is likely that more environmental harm will be tolerated. . . . Accordingly, decisions reflecting environmental considerations can most easily be made when other basic decisions are also being made, that is, during the early stages of project conceptualization and planning.

Sierra Club v. Office of Planning, 109 Hawai'i 411, 419, 126 P.3d 1098, 1106 (2006) (internal quotation marks, brackets, emphasis, and citations omitted). *See also Metcalf v. Daley*, 214 F.3d 1135, 1145 (9th Cir. 2000) ("NEPA's effectiveness depends entirely on involving environmental considerations in the initial decisionmaking process."); 40 C.F.R. § 1502.5(b) ("For applications to the agency[,] . . . [f]ederal agencies are encouraged to begin preparation of [environmental]

assessments or statements earlier, preferably jointly with applicable State or local agencies.”). The federal agencies must be involved in the EIS process before the Olowalu Town Master Plan obtains any entitlements, so that decision makers, including this Commission, have the benefit of federal input, which would include the expertise of the Army Corps and FHA, and because endangered and threatened species fall within the project area, the input of FWS and NMFS.

This Commission Cannot Accept the FEIS in its Current Form

In sum, the FEIS does not comport with the criterion in HAR § 11-200-23(b)(1) that the procedures for preparing and submitting the FEIS be completed in accordance with HAR chapter 11-200, because there has been no cooperation with federal agencies to comply with NEPA, in violation of HAR § 11-200-25. Simply put, because federal laws apply to this project, any EIS this Commission sanctions must include the environmental concerns of the relevant federal agencies, and, more importantly, thorough evaluation of every environmental impact they, with their federal resources, experience, and expertise, may foresee. Accordingly, this Commission cannot lawfully accept the FEIS in its current form.

The applicant still has the option of submitting a revised draft EIS, *see* HAR § 11-200-23(e), but only after it undertakes joint environmental review with the Army Corps and FHA.

Mahalo for the opportunity to testify.

Honoapi‘ilani Highway Improvements Consultation Comments

Current Division Planner Contact:
James Buika – James.Buika@co.maui.hi.us

Long Range Division Planner Contact:
Karen Comcowich – Karen.Comcowich@co.maui.hi.us

PROJECT DESCRIPTION:

The State Department of Transportation is proposing to realign the Honoapi‘ilani Highway to provide a reliable transportation facility in West Maui and improve Honoapi‘ilani Highway‘s resiliance by reducing the highways vulnerability to coastal hazards.

LONG RANGE DIVISION COMMENTS:

The realignment of Honoapi‘ilani Highway out of the Sea-Level Rise Exposure Area (SLR-XA) is supported in the Maui County General Plan and more specifically by the West Maui Community Plan. However, multimodal transportation options and Complete Streets elements should be incorporated into the Honoapi‘ilani Highway Improvements. In addition, thoughtful consideration should be given to the road design to ensure the realigned highway retains and enhances the existing character and scenic resources found in Ukumehame and Olowalu. The inclusion of trees and landscaping appropriate to the microclimate is also important.

GENERAL COMMENTS

The realignment of Honoapi‘ilani Highway out of the SLR-XA is supported by the West Maui Community Plan (WMCP), the Maui Island Plan (MIP) and the Countywide Policy Plan (CWPP) (see WMCP Policy 2.2.10, and Action 2.21; MIP 6.4.3 Action 3; CWPP H.1.b.). The design of the Honoapi‘ilani Highway Improvements will need to incorporate multimodal and Complete Street design elements, while thoughtfully considering the existing character and scenic resources of the communities through which it passes (MIP 6.4.3 a, and b; CWPP H.1.b, c, and g).

- **WMCP 2.2.10 |** Improve resilience of the transportation system to climate change related hazards such as sea level rise, flooding, and wildfires.
- **WMCP Action 2.21** | Work in partnership with the State Department of Transportation to prioritize and facilitate realignment of Honoapi‘ilani Highway out of the coastal hazard zone, and manage public lands makai of the realigned highway as wetlands, public parks, and open space.

- **MIP | Goal 6.4 |** An interconnected, efficient, and well-maintained, multimodal transportation system.
  Objective 6.4.3 | An island-wide, multimodal transportation system that respects and enhances the natural environment, scenic views, and each community’s character.
  6.4.3 a. Ensure that the roadway and transit alignments respect the natural environment and scenic views.
  6.4.3 b. Ensure that roadways and transit systems in rural areas and small towns enhance community character.

6.4.3-Action 3 | Urge the State to relocate Honoapi‘ilani Highway mauka between the Pali and Puamana, and develop a network of parks and open space on the makai side of the highway, in accordance with the Pali to Puamana Master Plan.

- **CWPP | H.** Diversify Transportation Options
  Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.
  Objective 1: Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable.
  b. Plan for the efficient relocation of roadways for the public benefit.
  c. Support the use of alternative roadway designs, such as traffic-calming techniques and modern roundabouts.
  d. Increase route and mode options in the ground-transportation network.
  e. Ensure that roadway systems are safe, efficient, and maintained in good condition.
  g. Design new roads and roadway improvements to retain and enhance the existing character and scenic resources of the communities through which they pass.

CONCERNS AND OPPORTUNITIES

Multimodal Transportation

The Maui County General Plan, including the West Maui Community Plan, supports transportation projects that increase active transportation, including biking and walking, and transit services. Honoapi‘ilani Highway is the primary connection between West Maui and the rest of the island of Maui. Designing the realigned portions of the highway to support transit, bike and pedestrian access would provide multiple benefits from resilience actions by increasing transportation options and making walking and bicycling safe and easy between and within communities.

- **WMCP 2.2.1** | Improve West Maui’s active transportation network by increasing multimodal transportation options, incorporating Complete Streets, adding new sidewalks, and improving existing sidewalks and other pedestrian and bicycle facilities.
- **WMCP 2.1.4** | Prioritize projects that provide multiple benefits from resilience actions.
- **WMCP 2.2.5 |** Support increased transit service within and between West Maui’s neighborhoods, parks, and commercial areas, and between the Kahului Airport and West Maui hotels.
- **WMCP 2.5.9 |** Encourage and increase active transportation options throughout West Maui to promote public health and reduce auto use and carbon emissions.

- **MIP| Goal 6.4** | An interconnected, efficient, and well-maintained, multimodal transportation system

Objective 6.4.1 | Provide for a more integrated island-wide transportation and land use planning program that reduces congestion and promotes more efficient (transit-friendly) land use patterns.

6.4.1.a. Plan for an integrated multi-modal transportation system comprised of public transit, bicycle, pedestrian, automobile, and other transportation modes.

6.4.1.b. Refocus transportation investment from the construction of additional roadways only for the automobile to the expansion of a multimodal transportation system.

6.4.1.c. Encourage the use of "complete streets" design methods.

- **MIP | Goal 6.5** An island-wide transit system that addresses the needs of residents and visitors and contributes to healthy and livable communities.
  Objective 6.5.1 | An integrated transit system that better serves all mobility needs of Maui's residents and visitors.

  6.5.1.b. Expand regional and inter-regional transit services, where appropriate, in heavily traveled corridors and within communities.

  6.5.1.e. Require new development where appropriate, to provide right-of-ways (ROWs) to accommodate transit circulation and support facilities.

  6.5.1.f. Identify, protect, and preserve, or acquire corridors for future inter-community transit use, including but not limited to, rail and also multimodal use corridors.

- **CWPP | H.** Diversify Transportation Options
  Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.
  Objective 2: Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation.

  a. Make walking and bicycling transportation safe and easy between and within communities.

  b. Require development to be designed with the pedestrian in mind.

  c. Design new and retrofit existing rights-of-way with adequate sidewalks, bicycle lanes, or separated multi-use transit corridors.

  d. Support the development of a countywide network of bikeways, equestrian trails, and pedestrian paths.

<u>Trees and Landscaping</u>

The West Maui Community Plan and Countywide Policy Plan support the inclusion of trees along public right of ways. The West Maui Community Plan specifies the use of native trees and landscaping that is appropriate to the microclimate. Trees and other appropriate landscaping should be included in the realigned Honoapi'ilani Highway Improvements.

- **WMCP 2.1.11** | Require new developments to install landscaping that reduces water use, using drought resistant and micro-climate appropriate design and plants including native

species, and gray water and water catchment systems where the State Department of Health allows it.

- **WMCP 2.3.4 |** All development must implement recommendations of the Maui County Planting Plan for street and parking area trees, encouraging the use of native and endemic plants. Plants that are on the Hawai‘i Pacific Weed Risk Assessment list must not be used.
- **WMCP 2.3.12** | Design landscape barriers along major roadways in such a manner as to maintain existing views of the mountains and ocean to the extent possible.
- **WMCP 2.5.5** | Include native trees that are appropriate for the microclimate in parks, along streets, trails, and greenways, and throughout the community to provide shade, beauty, and reduce sediment runoff.

- **CWPP | H.** Diversify Transportation Options
  Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.
  Objective 4: Improve and expand the planning and management of transportation systems.
    h. Accommodate the planting of street trees and other appropriate landscaping in all public rights-of-way.

Natural and Cultural Resources

The Maui County General Plan, the MIP and the WMCP all support protecting and enhancing natural and cultural resources. This includes using Low Impact Development strategies and vegitated buffers around gulches and wetlands, giving consideration to how agriculture areas will be impacted, particularly where there is active subsitance farming or lo‘i cultivation, and ensuring access to kuleana lands. It is noted that the project proponents have consulted with community members in development of the Environmental Impact Statement Preparation Notice, including the Aha Moku Council and Lineal Decedents. As final alignment and design for Honoapi‘ilani Highway Improvements are refined, protecting, and enhancing natural and cultural resources should be a priority. Continued involvement and collaboration with community members as plans are refined is encouraged.

- **WMCP 2.2.9 |** Protect and enhance natural and cultural resources during implementation of transportation projects through early consultation and community engagement with resource management agencies, residents, and cultural practitioners.
- **WMCP 2.3.1 |** Ensure new development projects provide continued access to kuleana lands protected under Section 7-1, Hawai‘i Revised Statutes.
- **WMCP 2.3.2 |**Gulches, as identified in the map in Figure 2.3 of this Plan, must remain in open space and no new permanent structures may be developed in or within 100 feet of the top of the bank of identified gulches, unless Low Impact Development strategies are implemented to prevent stormwater runoff.
- **WMCP 2.3.3** |Protect ocean and stream water quality by requiring that wetlands, as defined by traditional historic knowledge or by Section 404 of the Clean Water Act, be preserved with vegetated buffer areas that are adequate to protect them from pollutants.

- **WMCP 2.3.5 |** Require implementation of Low Impact Development practices in developments in West Maui to reduce stormwater runoff and protect water quality.
- **WMCP 2.3.8 |** Preserve and protect the region's cultural resources and traditional lifestyles, including agricultural pursuits, such as subsistence agriculture on lands owned by the State Department of Hawaiian Home Lands in Honokōwai and loʻi cultivation of Native Hawaiians in Honokōhau Valley, Kahoma Valley, Kauaʻula Valley, Olowalu, and Ukumehame.
- **WMCP 2.3.10 |** Existing areas of open space, including agricultural lands and gulches, should be viewed as a resource to be protected and enhanced.
- **WMCP 2.3.13 |** The marine and nearshore environment and open space areas are important assets of the region and should be protected and preserved. Habitat connectivity for threatened and endangered species, watersheds, undeveloped shoreline areas and other environmentally sensitive lands must be preserved.
- **WMCP 2.3.16 |** All development projects must engage in consultation with the Aha Moku ʻo Maui representative associated with the project area – either Moku ʻo Lāhainā or Moku ʻo Kāʻanapali – and provide evidence of this engagement to the Department.
- **WMCP 2.3.18 |** Any ground-altering activities in the areas described in this Plan's ascription list must have a cultural monitor on site, due to the sensitive nature of these areas, until cultural overlay policies are established by the Council. See Appendix C | Cultural Reserve Ascription List.

▪ **MIP | Goal 2.1 |** Our community respects and protects archaeological and cultural resources while perpetuating diverse cultural identities and traditions.
Objective 2.1.3 | Enhance the island's historic, archaeological, and cultural resources.
2.1.3.f | Support opportunities for public involvement with the intent to facilitate the protection and restoration of historic and archeological sites, including consultation with stakeholders.
2.1.3.g | Encourage the resolution of land title questions relating to Land Commission Awards and Royal patents.
2.1.3.h | Ensure compliance with historic preservation laws, and discourage demolition of properties that are determined to be eligible for listing on the National or State Register of Historic Places.

o **CWPP| B**. Preserve Local Cultures and Traditions |
Goal: Maui County will foster a spirit of pono and protect, perpetuate, and reinvigorate its residents' multi-cultural values and traditions to ensure that current and future generations will enjoy the benefits of their rich island heritage.
Objective 1: Perpetuate the Hawaiian culture as a vital force in the lives of residents.
a. Protect and preserve access to mountain, ocean, and island resources for traditional Hawaiian cultural practices.
f. Recognize and preserve the unique natural and cultural characteristics of each ahupuaʻa or district.
h. Ensure the protection of Native Hawaiian rights.

Objective 2 | Emphasize respect for our island lifestyle and our unique local cultures, family, and natural environment.

d. Recognize the interconnectedness between the natural environment and the cultural heritage of the islands.

Trails

The protection and enhancement of trails is encouraged throughout the Maui County General Plan. While it is not expected that the Honoapiʻilani Highway Improvements will develop additional trails, preservation of existing trails and options for new connections should be incorporated.

- **WMCP 2.5.8 |** Ensure existing government trails are preserved through the subdivision process or other approval process, such as land use designation change; reviews under Chapter 343, Hawaiʻi Revised Statutes; and reviews under Chapter 205A, Hawaiʻi Revised Statutes. Refer to the West Maui Trails Map (Figure 2.4, pg. 61) and consult with the Nā Ala Hele Trails and Access Program.
- **WMCP 2.5.3 |** Support the development of trails and greenways in West Maui as part of a larger integrated recreation and transportation network and manage existing public mauka to makai access along the tops of gulches as identified in Figure 2.3 (pg. 60) to prevent the spread of rapid ʻŌhiʻa death, feral ungulates, and other invasive species in upper watersheds.

- **MIP | GOAL 2.1 |**Our community respects and protects archaeological and cultural resources while perpetuating diverse cultural identities and traditions.
  OBJECTIVE 2.1.1 | An island culture and lifestyle that is healthy and vibrant a smeasured by the ability of residents to live on Maui, access and enjoy the natural environment, and practice Hawaiian customs and traditions in accordance with Article XII, Section7, Hawai`i State Constitution, and Section7-1, Hawai`i Revised Statutes(HRS).
  2.1.1.c Ensure traditional public access routes, including native Hawaiian trails, are maintained for public use.
- **MIP | Goal 6.6** |Maui will have a diverse range of active and passive recreational parks, wilderness areas, and other natural-resource areas linked, where feasible, by a network of greenways, bikeways, pathways, and roads that are accessible to all
  Objective 6.6.3 | An expanded network of greenways, trails, pathways, and bikeways.
  6.6.3.c Collaborate with the State and private land owners to ensure perpetual access and proper stewardship of traditional trails and access systems.

- **CWPP | H.** Diversify Transportation Options
  Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.

Objective 2: Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation.

e. Support the reestablishment of traditional trails between communities, to the ocean, and through the mountains for public use.

- **CWPP | G.** Improve Parks and Public Facilities
  Goal: A full range of island-appropriate public facilities and recreational opportunities will be provided to improve the quality of life for residents and visitors.
  Objective 1 | Expand access to recreational opportunities and community facilities to meet the present and future needs of residents of all ages and physical abilities.

  a. Protect, enhance, and expand access to public shoreline and mountain resources.

  b. Expand and enhance the network of parks, multi-use paths, and bikeways.

Undergrounding Utlities

Undergrounding utilities is supported throughout the Maui County General Plan. This may be an opportunity to work with MECO to underground utilities in the area where improvements are being implemented.

- **WMCP 2.5.20** | Promote the placement of utilities underground in new areas of development and in existing areas, where possible, unless desecration of iwi kūpuna is likely to occur or if the development lies within areas of significant cultural resources in the proposed cultural overlay, a permit will be required.

- **CWPP | I.** Improve Physical Infrastructure
  Goal: Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies.
  Objective 4: Improve the planning and management of infrastructure systems.

  j. Promote the undergrounding of utility and other distribution lines for health, safety, and aesthetic reasons.

Scenic Resources and Community Character

Ensuring scenic vistas and community character are considered and retained in the design of new roads or roadway improvements is supported in the WMCP, the MIP and the CWPP. While it is evident that the Honoapi'ilani Highway Improvements have considered the impacts of the alignment on the character and scenic resources of the surrounding area, it will also be important consider the character and scenic resources of the surrounding area in the design of the road and how it interacts with the surrounding communites.

- **WMCP 2.3.11|** Protect public mauka to makai view corridors in each subarea and scenic vistas.

- **MIP| Goal 6.4 |** An interconnected, efficient, and well-maintained, multimodal transportation system
  Objective 6.4.2| Safe, interconnected transit, roadway, bicycle, equestrian, and pedestrian network.
  6.4.2.a Ensure transit-, roadway-, and pedestrian-facilities design and level-of-service standards respect the unique character of our communities.
  Objective 6.4.3 | An island-wide, multimodal transportation system that respects and enhances the natural environment, scenic views, and each community's character.
  6.4.3.c Design all transit systems to respect visual corridors and Maui's character.

- **CWPP | H.** Diversify Transportation Options
  Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.
  Objective 1: Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable.
  - **g.** Design new roads and roadway improvements to retain and enhance the existing character and scenic resources of the communities through which they pass.

<u>Parks and Open Space</u>
Although this is not part of the scope of this project the realignement will offer the possibilty to achieve goals supported by the Maui County General Plan regarding protection and enhancement of shoreline resources, the developement of Parks and Open Space, and altenative modes of transportation makai of the realigned highway.

- **WMCP 2.1.5 |** Protect the shoreline and beaches by preserving waterfront land within the SLR-XA as open space wherever possible.

- **MIP | Goal 6.4 |** An interconnected, efficient, and well-maintained, multimodal transportation system
  Objective 6.4.2: Safe, interconnected transit, roadway, bicycle, equestrian, and pedestrian network.
  6.4.2.e Consider identification, acquisition where appropriate, and utilization of abandoned rightof-ways for bikeways, pedestrian pathways, and open-space networks.

- **MIP | Goal 6.6** Maui will have a diverse range of active and passive recreational parks, wilderness areas, and other natural-resource areas linked, where feasible, by a network of greenways, bikeways, pathways, and roads that are accessible to all
  Objective 6.6.3 An expanded network of greenways, trails, pathways, and bikeways.
  6.6.3.a Link existing and future park sites, natural areas, the shoreline, and residential areas with a network of bikeways, pedestrian paths, trails, and greenways.

6.6.3.b Support the implementation of plans and programs that facilitate pedestrian mobility and access to active and passive recreation areas and sites.

- **CWPP | H.** Diversify Transportation Options
  Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.
  Objective 1: Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable.
  f. Preserve roadway corridors that have historic, scenic, or unique physical attributes that enhance the character and scenic resources of communities.

- **CWPP | A.** Protect the Natural Environment
  Goal: Maui County's natural environment and distinctive open spaces will be preserved, managed, and cared for in perpetuity.
  Objective 2: Improve the quality of environmentally sensitive, locally valued natural resources and native ecology of each island.
  a. Protect and restore nearshore reef environments and water quality.
  e. Mitigate the negative effects of upland uses on coastal wetlands, marine life, and coral reefs.

- **CWPP | L.** Mitigate Climate Change and Work Toward Resilience
  Goal: Minimize the causes and negative effects of climate change.
  Objective 2: Reduce the impacts of sea-level rise by acknowledging climate change, adapting, mitigating, and planning accordingly.
  Policies:
  a. Evaluate development to assess potential short-term and long-term sea-level rise impacts on nearshore environments.
  b. Improve efforts to mitigate and plan for the impact of sea-level rise.
  c. Protect undeveloped beaches, dunes, and ecosystems, and restore natural shoreline processes.
  e. Strengthen coastal-zone management, re-naturalization of shorelines, where possible, and filtration or treatment of urban and agricultural runoff.

REGION 9
SAN FRANCISCO, CA 94105

February 26, 2025

Richelle Takara, Division Administrator
Federal Highways Administration, Hawai'i Division
300 Ala Moana Boulevard, Room 3-229
Honolulu, Hawaii 96850

Ken Tatsuguchi, Project Engineer
Hawaii Department of Transportation Highways, Planning Branch
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Subject: EPA Comments for the Draft Environmental Impact Statement for the Honoapiilani Highway Improvements Project Maui, Hawaii (CEQ# 20250002)

Dear Richelle Takara and Ken Tatsuguchi:

The U.S. Environmental Protection Agency has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA). The CAA Section 309 role is unique to EPA. It requires EPA to review and comment on the environmental impact of any proposed federal action subject to NEPA's environmental impact statement requirements and to make its comments public.

EPA 309 Review Summary

EPA did not identify significant concerns to be addressed in the final EIS. We acknowledge and recognize our colleagues in the state for continuing the NEPA process to analyze and deliver this project following the devastating wildfire impacts to Lahaina just north of the proposed project area. We provided scoping comments to the Hawaii Department of Transportation and Federal Highways Administration and accepted the invitation to provide early coordination as defined in Title 23 United States Code Section 139(d) and (5), and Title 40 Code of Federal Regulations, part 1508.5 on April 29, 2022. We note that many of our scoping comments were adopted in the development of the Draft EIS, and that our November 1, 2024, comments on the Administrative Draft EIS regarding aquatic resources and community engagement were fully addressed in the Draft EIS. We appreciate HDOT and FHWA's emphasis of continuing community dialogue (page 3.7-14) as it pertains to protecting cultural resources pursuant to the National Historic Preservation Act, Section 106.

The EPA appreciates the opportunity to review this DEIS. If you have any questions, please contact me at (415) 972-3659 or the NEPA reviewer, Zac Appleton, at (415) 972-3321 or appleton.zac@epa.gov.

Sincerely,

Francisco Dóñez
Manager
Environmental Review Section 2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
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In Reply Refer To:
2023-0041712-S7-001

March 6, 2025

Comment Log Submission No. 84

Richelle M. Takara, P.E.
Division Administrator
U.S. Department of Transportation
Federal Highway Administration
300 Ala Moana Blvd., Rm 3-299
Honolulu, Hawai‘i 96850

Subject: Comments on Honoapi‘ilani Highway Realignment Project Draft Environmental Impact Statement, Maui

Dear Richelle Takara:

This letter is in response to your January 6, 2025, request for U.S. Fish and Wildlife Service (Service) comments on the draft Environmental Impact Statement (DEIS) for the Honoapi‘ilani Highway Improvement Project (HDA-HI, Federal-aid Project No. RAEM-030-1(059)). During the coordinating agency comment period, you specifically requested our comments on Chapters 3.9 (Water Resources, Wetlands, and Floodplains), 3.10 (Flora and Fauna, Endangered Species), and 5.0 (Preferred Alternative).

This letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.), as amended (ESA). Mahalo for incorporating our standard and project specific recommended avoidance and minimization measures for ESA listed species into the DEIS and for continuing to collaborate with us to refine, develop, and implement project specific avoidance and minimization measures to avoid adverse impacts. Additionally, we appreciate your efforts to incorporate our Best Management Practices (BMPs) for Work In and Around Aquatic Environments.

Chapter 3.9: Water Resources, Wetlands, and Floodplains

- We recommend culverts and bridges over streams be designed with the height and width to handle periodic massive surges of water from torrential rain events that are known to occur in the area. Due to climate change, 100-year storms may become more frequent. Flooding has the potential to destroy ae‘o (Hawaiian stilt, *Himantopus mexicanus knudseni*) and nēnē (Hawaiian goose, *Branta sandvicensis*) nests that may be found in the project area. Additionally, ensuring culverts and bridges have the height and width to handle 100-year storm torrential rains may also minimize impacts to other trust

resources protected under the Fish and Wildlife Coordination Act. These recommendations also apply to Appendix 3.10 section 2.2.1.

- For erosion control during construction, we recommend using materials (e.g., biosock) that are at least 3 feet (ft) in diameter to reduce chances of runoff into the ocean during torrential rain. The typical 1 ft diameter biosock will likely not serve as an adequate barrier during torrential rainfall, especially in an area that is highly degraded, expansive ephemeral wetland habitat combined with known high flow rates in streams during these storm events. Sedimentation runoff onto the beach and into the ocean degrades sea turtle habitat and has the potential to bury sea turtle nests. This emphasizes the importance of incorporating our Best Management Practices (BMPs) for Work In and Around Aquatic Environments to minimize project impacts. These BMPs may also help minimize impacts to other trust resources protected under the Fish and Wildlife Coordination Act.

Chapter 3.10 Flora and Fauna, Endangered Species and Appendix 3.10

- The DEIS describes monitoring for waterbirds by a qualified biologist, but then follows up with: *The contractor will assign dedicated, trained, competent personnel to perform daily visual monitoring and nest surveys prior to the start of and during construction work to check for listed species bird nests. The daily monitoring protocol would include designated personnel to walk the project site every morning prior to the start of construction work to determine if any ESA-listed species nests are present at the work site and note if any listed individuals were present.*
    - All surveys to detect for the presence of aeʻo nests and aeʻo exhibiting defensive nest protection behavior should be carried out by a qualified biologist with knowledge of the species' life history. If heavy rains result in ephemeral wetlands, ʻalae keʻokeʻo (Hawaiian coot, *Fulica alai*) should be surveyed for as well.
- The DEIS describes morning surveys and monitoring for nēnē by a qualified biologist, but then follows up with: *The contractor will assign dedicated, trained, competent personnel to perform daily visual monitoring and nest surveys prior to the start of and during construction work to check for listed species bird nests. The daily monitoring protocol would include designated personnel to walk the project site every morning prior to the start of construction work to determine if any ESA-listed species nests are present at the work site and note if any listed individuals were present*.
    - All surveys to detect for presence of nēnē nests and nēnē exhibiting defensive nest protection behavior should be carried out by a qualified biologist with knowledge of the species' life history.
- We recommend including all final biological survey and monitoring protocols in the final EIS under Appendix 3.10. We encourage your team to submit draft survey and monitoring protocols/standard operating procedures to our office for review and comments prior to finalization. We also encourage incorporating adaptive management into these procedures and triggers for modifying them.
- The draft EIS states additional biological surveys will be performed by trained biologists in areas of "permanent BMPs." The Service recommends providing more details about this objective, including protocols and habitat features that support listed species in the draft EIS.

- We recommend that *temporary* signs be placed around the project area during construction to remind workers of the potential presence of aeʻo and nēnē and to drive slowly (10 miles per hour as stated in the DEIS). Additionally, *permanent* signs should be placed along the highway through the Ukumehame wetland area alerting drivers of the potential presence of aeʻo and nēnē and for reducing the speed limit through the area to minimize injury and mortality to listed birds from vehicle strikes.
- Avoid placing staging areas in or directly adjacent to wetland habitat (jurisdictional and nonjurisdictional) and streambanks identified by the consultants to avoid and minimize impacts to habitat that supports listed waterbirds and nēnē.
- Any hazing that occurs to nēnē must follow the 4(d) rule. We recommend keeping a copy of the regulations at the on-site office for easy reference. A key section of the 4(d) rule follows:
    - Before implementing any such intentional harassment activities during the nēnē breeding season (September through April), a qualified biologist knowledgeable about the nesting behavior of nēnē must survey in and around the area to determine whether a nest or goslings are present. If a nest is discovered, the Service must be notified within 72 hours and the following measures implemented to avoid disturbance of nests and broods:
        - No disruptive activities may occur within a 100-ft (30-meter) buffer around all active nests and broods until the goslings have fledged;
        - Brooding adults (i.e., adults with an active nest or goslings) or adults in molt may not be subject to intentional harassment at any time; and
        - The landowner must arrange follow-up surveys of the property by qualified biologists to assess the status of birds present.
- Hawaiian yellow-faced bees are known to occur in scattered populations along the western coastline of Mauna Kahālāwai (Maui Komohana or West Maui Mountains). Coastal populations of yellow-faced bees occur in habitat along rocky shorelines with naupaka (*Scaevola taccada*) and tree heliotrope (*Heliotropium arboreum*) with either landscaped vegetation, nonnative kiawe (*Neltuma pallida*), or bare rock inland. Bees are restricted to an extremely narrow corridor, typically 33 to 66 ft (10 to 20 meters) wide, and do not occur on barren sandy beaches or inland, or on landscaped native plants on hotel grounds. Documented nectar plants include naupaka, ʻilima (*Sida fallax*), ʻakoko (*Euphorbia* spp.), pua kala (*Argemone glauca*), naio (*Myoporum sandwicense*), and tree heliotrope. Threats to yellow-faced bees include habitat destruction and modification from land use change, nonnative plants, ungulates, and fire, along with predation by nonnative ants and wasps. Mahalo for including the Service's avoidance and minimization measures for coastal Hawaiian yellow-faced bees:
    - If an action will occur in or adjacent to known occupied habitat, a buffer area around the habitat may be required and can be worked out on a site-specific basis through consultation with the Service.
    - For coastal species, protect all coastal strand habitat from human disturbance, including:
        - No fires or wood collecting.

        - Leave woody debris in place.
        - Restrict vehicles to existing roads and trails.
        - Post educational signs to inform people of the presence of sensitive species.
    - Avoiding disturbance (i.e., humans, machines, cars, staging) of coastal vegetation on the makai side of the original road will help avoid and minimize impacts to yellow-faced bees.
- Table 3.9.10 states that project effects on listed waterbirds and nēnē would be minimal due to the implementation of avoidance and minimization measures outlined in Appendix 3.10. The project may potentially impact aeʻo and nēnē. Therefore, we recommend that the cumulative impacts analysis in the draft EIS include an assessment for the construction phase and the normal operations phase. This should specifically address how the highway designs in the Ukumehame area will avoid car strikes and minimize impacts to aeʻo and nēnē. Additionally, we encourage your team to consider the anticipated increase in waterbird populations (aeʻo and ʻalae keʻokeʻo) and nēnē in the Ukumehame area following wetland restoration when conducting the cumulative impact analysis. Currently, neither Chapter 3.10 nor the Biological Resource Discussion in Appendix 3.10 includes an evaluation of the impacts to listed waterbirds and nēnē from the routine operations of the new highway after construction.
- The draft EIS states nighttime work is not anticipated; however, if it does become necessary, the DOT and FHWA will consult with the Service (see Appendix 3.9, page 4). Chapter 3.10, Table 3.10.9 states the project does not anticipate to impact seabirds, as standard Service seabird avoidance and minimization measures will be implemented. However, Table 3.10.5 mentions that nighttime work may occur, but not during the seabird fallout season. Please confirm whether nighttime work will occur during the seabird fallout season. If it is determined that nighttime work will occur during the seabird fallout season, we recommend contacting our office several months in advance for guidance to avoid adverse impacts to listed seabirds. Additionally, we recommend following the 2022 Maui Dark Skies Ordinance for all permanent lighting. For permanent lighting, limit these lights as human safely considerations allow, and include light frequencies and intensities that have the least impact on seabirds and sea turtles. There is also a growing body of peer-reviewed literature and seabird groups to help guide you with the most current animal friendly lighting.
- For revegetation efforts, we recommend using only native plants, in particular those documented in the biological survey: ʻilima (*Sida fallax*), ʻiliahialoʻe (*Santalum ellipticum*), ʻaʻaliʻi (*Dodonaea viscosa*), hoary abutilon (*Abutilon incanum*), akulikuli (*Sesuvium portulacastrum*), milo (*Thespesia populnea*), and naupaka (*Scaevola taccada*). If possible, we recommend avoiding disturbance to endemic plant species such as ʻiliahialoʻe that currently occupy the project area. ʻIliahialoʻe is an endemic plant species to the Hawaiian Islands. Limiting disturbance of non-listed endemic plants help to prevent their decline.
- For erosion control, we recommend following our comment in Chapter 3.9 above related to biosocks.

- To minimize collisions for seabirds, we recommend:
    - Flagging the tops of monopoles, cranes, and crane wires/cables.
    - Flagging fencing that extends above vegetation.
- To avoid and minimize invasive species potential impacts to ESA listed species, we recommend incorporating our invasive species biosecurity protocols into your project planning (Attachment A). The proposed project will be transporting a substantial amount of materials (i.e., construction materials or aggregate, etc.), vehicles, machinery, equipment, and personnel between sites, which has the potential to unintentionally introduce invasive species to the project site.
- Under Mammals, the DEIS states that ʻōpeʻapeʻa (Hawaiian hoary bat, *Lasiurus cinereus semotus*) have not been detected on Maui and cites Tomich 1986. Current data show that ʻōpeʻapeʻa do occur on Maui: https://dlnr.hawaii.gov/wildlife/files/2021/01/MauiBatsHTHFebruary2020.pdf
    - The DEIS states that if scheduling becomes a serious issue and cutting down or pruning trees taller than 15 feet cannot be avoided during the bat breeding season (June 1 through September 15), FHWA will consult with the Service. We recommend FHWA consult with us several months in advance if scheduling is anticipated to prevent implementing the Service's avoidance and minimization measures for ʻōpeʻapeʻa or any other listed species that occurs or may occur in the project area.
- Please include Service avoidance and minimization measures for sea turtles (honu (green sea turtles, *Chelonia mydas*) and honuʻea (Hawksbill sea turtles, *Eretmochelys imbricata*)). Construction on, or in the vicinity of, beaches can result in sand and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff, and an increase in direct and ambient light pollution, which may disorient hatchlings or deter nesting females. Off-road vehicle traffic may result in direct impacts to sea turtles or nests, and contributes to habitat degradation through erosion and compaction. Information for projects with a beach hardening, stabilization, or nourishment component: Projects that alter the natural beach profile, such as nourishment and hardening, including the placement of seawalls, jetties, sandbags, and other structures, are known to reduce the suitability of on-shore habitat for sea turtles. These types of projects often result in sand compaction, erosion, and additional sedimentation in nearshore habitats, resulting in adverse effects to the ecological community and may inhibit future sea turtle nesting. The hardening of a shoreline increases the potential for erosion in adjacent areas, resulting in subsequent requests to install stabilization structures or conduct beach nourishment in adjacent areas. Given projected sea level rise estimates, the likelihood of increase in storm surge intensity, and other factors associated with climate change, we anticipate that beach erosion will continue and likely increase. Where possible, projects should consider alternatives that avoid modifying or hardening of coastlines. Beach nourishment or beach hardening projects should evaluate the long-term effect to sea turtle nesting habitat and consider the cumulative effects. Avoidance and minimization measures include
    - No vehicle use on or modification of the beach/dune environment during the sea turtle nesting or hatching season (See nesting date ranges above).
    - Do not remove native dune vegetation.

- Have a biologist familiar with sea turtles conduct a visual survey of the project site to ensure no basking sea turtles are present.
- If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area.
- Cease all activities between the basking turtle and the ocean.
- Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used.
- Do not stockpile project-related materials in the intertidal zone, reef flats, sandy beach and adjacent vegetated areas, or stream channels.
- Optimal sea turtle nesting habitat is a dark beach free of barriers that restrict sea turtle movement. Nesting turtles may be deterred from approaching or laying successful nests on lighted or disturbed beaches. They may become disoriented by artificial lighting, leading to exhaustion and placement of a nest in an inappropriate location (such as at or below the high tide line). Hatchlings that emerge from nests may also be disoriented by artificial lighting. Inland areas visible from the beach should be sufficiently dark to allow for successful navigation by hatchlings to the ocean. To avoid and minimize project impacts to sea turtles from lighting we recommend:
  - Avoiding nighttime work during the nesting and hatching season.
  - Minimizing the use of temporary and permanent lighting on or near beaches and shield all project-related temporary and permanent lights so the light is not visible from any beach.
  - If lights can't be fully shielded or if headlights must be used, fully enclose the light source with light filtering tape or filters.
  - Incorporating design measures into the construction or operation of buildings adjacent to the beach to reduce ambient outdoor lighting such as tinting, reducing the height of exterior lighting to below 3 feet and pointed downward or away from the beach, and minimizing light intensity to the lowest level feasible and, when possible, include timers and motion sensors.
- Implementing our sea turtle avoidance and minimization measures, including our BMPs for Work In and Around Aquatic Environments, will also help avoid and minimize project impacts to sea turtle nesting habitat, including proposed critical habitat that overlaps with the northern end of the project area. Additionally, we recommend keeping workers, staging areas, and temporary resting equipment on the mauka side of the old highway, away from the beach, especially during sea turtle nesting season and within the proposed green sea turtle critical habitat.

Chapter 5.0 Preferred Alterative

- We recommend including conceptual designs of the preferred alternative viaduct through the Ukumehame area, including identified wetland habitat (jurisdictional and nonjurisdictional) in the area, architectural/design features aimed at reducing car strikes for nēnē and listed waterbirds (e.g., diversion poles and/or guardrails), and any land alterations to assist with stormwater management and highway runoff as described in section 3.9.8 of Chapter 3.

- In section 5.1.1.3, the DEIS mentions guardrails would be placed on either side of the viaduct. We recommend clarifying whether the architectural design features aimed at reducing listed bird car strikes will be placed on one side or both sides of the highway.
- We recommend providing more details about the swales (Appendix 3.10) to control stormwater, and other highway design features aimed at minimizing highway contaminant runoff into wetland habitat to reduce impacts to nēnē, ae‘o, and other listed waterbirds that may use the wetland habitat in the project area. Specifically, clarify where the stormwater will be diverted to or be collected, and will these areas have the potential to attract nēnē and listed waterbirds.
- Additionally, the proposed grassy swales adjacent to the road may increase the risk for nēnē car strikes. We recommend you inquire with the Nēnē Recovery Action Group about the proposed grassy swales and for potential alternative options for the swales, as applicable.

If you have questions pertaining to our recommendations, or our shared responsibilities under the ESA, please contact Carrie Harrington at carrie_harrington@fws.gov or 808-207-4698. When referring to this project, please include the follow reference number: 2023-0041712-S7-001.

Sincerely,

Hawai ‘i and Maui Nui Team Manager
Pacific Islands Fish and Wildlife Office

Attachment A. Service Invasive Species Biosecurity Protocol for Maui

Attachment A.

PIFWO Invasive Species Biosecurity Protocols

(Updated July 2024)

Project activities may introduce or spread invasive species, causing negative ecological consequences to new areas or islands, resulting in potential impacts to fish, wildlife, and their habitat. For example, seeds of invasive plant species (e.g., *Chromolaena odorata*, *Senecio madagascariensis*, *Cyathea cooperi*, or *Miconia calvescens*) can be inadvertently transported on equipment from a previous work site to a new site where the species are not present. Likewise, equipment used in an area infected with a pathogen or insect pest that can have ecological consequences (e.g., rapid ʻōhiʻa death (*Ceratocystis spp.*), black twig borer (*Xylosandrus compactus*), or naio thrips (*Klambothrips myopori*), if not properly decontaminated, can act as a vector to introduce the pathogen into a new area. Additionally, vehicles must be properly inspected and cleaned to ensure vertebrate or invertebrate pests do not stowaway and spread to other areas. These are just a few examples of how even well-intended project activities may inadvertently introduce or spread invasive species.

To avoid and minimize invasive species potential impacts to fish, wildlife, and their habitat we recommend incorporating general biosecurity protocols into your project planning (see below). Additional consultation is recommended if project activities involve transportation of materials, equipment, vehicles, etc. between islands or transpacific movement of materials or equipment.

Invasive Species Biosecurity Protocol

The following biosecurity protocol is recommended to be incorporated into planning for your project to avoid or minimize transportation of invasive species with potential to impact to fish, wildlife, and their habitat. Cleaning, treatment, and/or inspection activities are the responsibility of the equipment or vehicle owner and operator. However, it is ultimately the responsibility of the action agency to ensure that all project materials, vehicles, machinery, equipment, and personnel are free of invasive species before entry into a project site. Please refer to the resources listed below for current removal/treatment recommendations that may be relevant to your project.

1. Cleaning and treatment:
   Project applicants should assume that all project materials (i.e., construction materials, or aggregate such as dirt, sand, gravel, etc.), vehicles, machinery, and equipment contain dirt and mud, debris, plant seeds, and other invasive species, and therefore require thorough cleaning. Treatment for specific pests, for example, trapping and poison baiting for rodents, or baiting and fumigation for insects, should be considered when applicable. For effective cleaning we offer the following recommendations prior to entry into a project site:
   a. Project materials, vehicles, machinery, and equipment must be pressure washed thoroughly (preferably with hot water) in a designated cleaning area. Project materials, vehicles, machinery, and equipment should be visibly free of mud/dirt (excluding aggregate), seeds, plant debris, insects, spiders, frogs (including frog eggs), other vertebrate species (e.g., rodents, mongoose, feral cats, reptiles, etc.), and rubbish. Areas of particular concern include bumpers, grills, hood

compartments, wheel wells, undercarriage, cabs, and truck beds. Truck beds with accumulated material are prime sites for hitchhiking invasive species.

b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food, which can attract pests (i.e., rodents and insects). The interiors of vehicles and the cabs of machinery should be vacuumed clean particularly for any plant material or seeds.

2. Inspection:
    a. Following cleaning and/or treatment, project materials, vehicles, machinery, and equipment, must be visually inspected by its user, and be free of mud/dirt (excluding aggregate), debris, and invasive species prior to entry into a project site. For example, careful visual inspection of a vehicle's tires and undercarriage is recommended for any remaining mud that could contain invasive plant seeds.
    b. Any project materials, vehicles, machinery, or equipment found to contain invasive species (e.g., plant seeds, invertebrates, rodents, mongoose, cats, reptiles, etc.) must not enter the project site until those invasive species are properly removed/treated.

3. For all project site personnel:
    a. Prior to entry into the project site, visually inspect and clean your clothes, boots or other footwear, backpack, radio harness, tools and other personal gear and equipment for insects, seeds, soil, plant parts, or other debris. We recommend the use of a cleaning brush with sturdy bristles. Seeds found on clothing, footwear, backpacks, etc., should be placed in a secure bag or similar container and discarded in the trash rather than being dropped to ground at the project site or elsewhere.

4. Additional considerations:
    a. Consider implementing a Hazard Analysis and Critical Control Point (HACCP) plan (https://www.fws.gov/policy/A1750fw1.html) to improve project planning around reducing the risk of introducing or spreading invasive species.
    b. When applicable, use pest-free or low-risk sources of plants, mulch, wood, animal feed or other materials to be transported to a project site.
    c. For projects involving plants from nurseries (e.g., outplanting activities, etc.), all plants should be inspected, and if necessary, appropriately cleaned or treated for invasive species prior to being transported to the project site.
    d. Avoid unnecessary exposure to invasive species at a particular site (to the extent practical) to reduce contamination and spread. For example, if your project involves people or equipment moving between multiple locations, plan and organize timelines so that work is completed in native habitat prior to working in a disturbed location to reduce the likelihood of introducing a pest into the native habitat.
    e. Maintain good communication about invasive species risks between project managers and personnel working on the project site (e.g., conduct briefings and training about invasive species). Ensure prevention measures are communicated to the entire project team. Also consider adding language on biosecurity into

contracts or permitting mechanisms to provide clarity to all involved in the project. Report any species of concern or possible introduction of invasive species to appropriate land managers.

For current removal/treatment recommendations please refer to the following:
Hawaiian Islands:

- Hawai‘i Island – https://www.biisc.org/
- **Maui – https://mauiinvasive.org/**
- Moloka‘i - https://www.molokaiisc.org/
- Lāna‘i - https://pulamalanai.com/
- O‘ahu – https://www.oahuisc.org/
- Kaua‘i – https://www.kauaiisc.org/

Species-Specific Biosecurity Protocols

The following section contains specific protocols for a few select invasive species of concern in the Pacific Islands highlighted because of their potential to easily spread and cause great harm to native species and habitats. Other invasive species may not have existing specific protocols or may already be minimized by implementing the general invasive species protocols above (e.g., invasive plants, invertebrates, larger vertebrates). Information on other invasive species can be found in the island specific links below. As new threats emerge that require development of species-specific protocols, those may be added to this list.

Table 1. Current island distribution of invasive species with specific biosecurity protocols in the Pacific Islands (PIFWO jurisdiction).

Island	Invasive Species with Specific Protocols			
	Rapid ‘Ōhi‘a Death	**Little Fire Ant**	**Coconut Rhinoceros Beetle (CRB)**	**Brown Treesnake**
Island of Hawai‘i	widespread	widespread	detected	not present
Maui	present	incipient	detected in Nov 2023, not observed since. The state and Service recommend implementing CRB biosecurity BMPs	not present
O‘ahu	incipient	incipient	widespread	not present
Kaua‘i	widespread	not present	not present	not present

Rapid ‘Ōhi‘a Death (ROD)

If working directly with ‘ōhi‘a trees (e.g., sampling suspected trees, clearing an area of ‘ōhi‘a, etc.) or in an area(s) known to be highly infested with ROD, additional consultation is recommended.

Current Distribution of ROD: island of Hawai‘i, Maui, O‘ahu, Kaua‘i (https://cms.ctahr.hawaii.edu/rod

While ROD is not currently reported on Molokaʻi at this time, if you are in ʻōhiʻa forest it would be prudent to take precautions. Also, consider where the equiptment to be used on Molokaʻi will be coming from, and if from an island with confirmed ROD, take the necessary precautions.

Rapid ʻŌhiʻa Death (ROD) is a caused by a fungal pathogen (*Ceratocystis* spp.) that attacks and kills ʻōhiʻa trees (*Metrosideros polymorpha*). ʻŌhiʻa is endemic to the Hawaiian Islands and is the most abundant native tree species, comprising approximately 80 percent of Hawaiʻi's remaining native forests.

For more information about ROD including its current distribution, ROD science updates, and the latest on ROD protocol, please visit www.rapidohiadeath.org.

To reduce the risk of spreading ROD, the following best management practices and decontamination protocol are recommended:

Best Management Practices for ROD

1. Never transport any part of an ʻōhiʻa tree between different areas of an island or to a different island.

2. Do not use equipment from ROD infected islands on another island unless it is very specialized equipment and follows the decontamination protocol described below.

3. Avoid wounding ʻōhiʻa trees and roots with mowers, chainsaws, weed eaters, and other tools. If an ʻōhiʻa receives a minor injury like a small broken branch, then give the injury a clean, pruning-type cut (close to the main part of the trunk or branch) to promote healing, and then spray the entire wounded area with a pruning seal.

4. Always report suspect ROD ʻōhiʻa trees observed within you project area. ROD is a wilt disease that cuts off the supply of water and nutrients to the tree. The primary symptom to look for is an entire canopy or a large branch with dying leaves or red discolored leaves. Please record the GPS coordinates and location and take a picture of the tree if possible. Please report suspected ROD ʻōhiʻa trees to the following agencies:
    a. Island of Hawaiʻi – BIISC: 808-969-8268 (ohialove@hawaii.edu)
    b. Maui – MISC: 808-573-6472 (miscpr@hawaii.edu)
    c. Molokaʻi – TNC: 808-553-5236 ext. 6585 (lbuchanan@tnc.org)
    d. Oʻahu – OISC: 808-266-7994 (oisc@hawaii.edu)
    e. Kauaʻi – KISC: 808-821-1490 (kisc@hawaii.edu)

ROD Decontamination Protocol

1. Clothes, footwear, backpacks, and other personal equipment
    a. Before leaving the project site, remove as much mud and other contaminants as possible. Use of a brush with soap and water to clean gear is preferred. Footwear,

backpacks, and other gear must be sanitized by spraying with a solution of >70 percent isopropyl alcohol or a freshly mixed 10 percent bleach solution.

2. Vehicles, machinery, and other equipment
    a. Vehicles, machinery, and other equipment must be thoroughly hosed down with water (pressure washing preferred) and visibly free of mud and debris, then sprayed with a solution of >70 percent isopropyl alcohol or a freshly mixed 10 percent bleach solution. Use of a "pump-pot" sprayer is recommended for the solution and a hot water wash is preferred. Be sure to thoroughly clean the undercarriage, truck bed, bumpers, and wheel wells.
    b. If non-decontaminated personnel or items enter a vehicle, then the inside of the vehicle (i.e., floor mats, etc.) must be subsequently decontaminated by removing mud and other contaminants and sprayed with the one of the same aforementioned sanitizing solutions.

3. Cutting tools
    a. All cutting tools, including machetes, chainsaws, and loppers must be sanitized to remove visible mud and other contaminants. Tools must be sanitized using a solution of >70 percent isopropyl alcohol or a freshly mixed 10 percent bleach solution. One minute after sanitizing, one may apply an oil-based lubricant to chainsaw chains or other metallic parts to prevent corrosion as bleach is corrosive to metal.

NOTE: When using a 10 percent bleach solution, surfaces should be cleaned with a minimum contact time of 30 seconds. Bleach must be mixed daily and used within 24 hours, as once mixed it degrades. Bleach will not work to disinfect surfaces that have high levels of organic matter such as sawdust or soil. Because bleach is also corrosive to metal, a water rinse after proper sanitization is recommended to avoid corrosion.

Little Fire Ant (LFA)

For the most current status on distribution and infestations, please visit http://stoptheant.org/lfa-in-hawaii/

The little fire ant (*Wasmannia auropunctata*), or LFA, is an invasive species with a painful sting that can inhabit many different environments. In Hawai‘i, it often infests agricultural fields and farms, damaging crops and stinging unsuspecting workers. Little fire ants are also highly disruptive to native tropical ecosystems and harmful to wildlife. Slow moving, but tiny and capable of foraging 24 hours a day with multiple queens per colony, LFA is a formidable threat to biodiversity, agriculture, and quality of life on tropical islands in the Pacific.

For more information about LFA including helpful guides and workshops for treating or detecting LFA, please visit www.littlefireants.com.

To reduce the risk of spreading LFA, the following biosecurity protocol is recommended:

Biosecurity Protocol for LFA

1. For projects involving plants from nurseries (e.g., outplanting activities, etc.), all plants should be inspected for little fire ants and other pests prior to being transported to the project site. If plants are found to be infested by ants of any species, plants should be sourced from an alternative nursery and the infested nursery should follow treatment protocols recommended by the Hawai‘i Ant Lab (https://littlefireants.com/wp-content/uploads/2020-Management-of-Pest-Ants-in-Nurseries-min.pdf).

2. All work vehicles, machinery, and equipment should follow steps 1 and 2 in the "Invasive Species Biosecurity Protocol" for (1) cleaning and treatment and (2) inspection for invasive ants prior to entering a project site.

3. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter the project site until it is properly treated (https://littlefireants.com/how-to-treat-for-little-fire-ants-for-homeowners/#recommended-bait-products) and re-tested. Infested vehicles must be treated following recommendations by the Hawai‘i Ant Lab (https://littlefireants.com/resource-center/) or another ant control expert and in accordance with all State and Federal laws. Treatment is the responsibility of the equipment or vehicle owner. Ultimately however, it is the responsibility of the action agency to ensure that all project materials, vehicles, machinery, and equipment follow the appropriate protocol(s).

4. General Vehicle Ant Hygiene: Even the cleanest vehicle can pick up and spread little fire ant. Place MaxForce Complete Brand Granular Insect Bait (1.0 percent Hydramethylnon; https://labelsds.com/images/user_uploads/Maxforce%20Complete%20Label%201-5-18.pdf) into refillable tamper resistant bait stations. An example of a commercially available refillable tamper resistant bait station is the Ant Café Pro (https://www.antcafe.com/). Place a bait station (or stations) in the vehicle and note that larger vehicles, such as trucks, may require multiple stations. Monitor bait stations frequently (every week at a minimum) and replace bait as needed. If the bait station does not have a sticker to identify the contents, apply a sticker listing contents to the station.

5. Gravel, building materials, or other equipment such as portable buildings should be baited using MaxForce Complete Brand Granular Insect Bait (1.0 percent Hydramethylnon; https://labelsds.com/images/user_uploads/Maxforce%20Complete%20Label%201-5-18.pdf) or AmdroPro (0.73 percent Hydramethylnon; https://connpest.com/labels/AMDROPRO.pdf) following label guidance.

6. Storage areas that hold field tools, especially tents, tarps, and clothing should be baited using MaxForce Complete Brand Granular Insect Bait (1.0 percent Hydramethylnon; https://labelsds.com/images/user_uploads/Maxforce%20Complete%20Label%201-5-18.pdf) or AmdroPro (0.73 percent Hydramethylnon; https://connpest.com/labels/AMDROPRO.pdf) following label guidance.

7. Vehicles that have entered a project site known or thought to overlap with areas infested with LFA should subsequently be tested for LFA with baiting in accordance with protocol recommended by the Hawai‘i Ant Lab (https://littlefireants.com/survey-your-home-for-lfa/).

8. If LFA are detected, please report it to 808-643-PEST (Hawai‘i), 671-475-PEST (Guam), or 684-699-1575 (American Samoa). Please visit https://littlefireants.com/identification-of-little-fire-ants/ for assistance in identifying LFA.

Coconut Rhinoceros Beetle (CRB)

Current Distribution of CRB in Hawai‘i: O‘ahu, detected on Maui in November 2023 but not observed since (there are ongoing search efforts: https://governor.hawaii.gov/newsroom/hdoa-news-release-on-on-going-efforts-against-the-coconut-rhinoceros-beetle-on-maui/)

The coconut rhinoceros beetle (*Oryctes rhinoceros*), or CRB, is a large, horned scarab beetle native to Southeast Asia. An invasive pest where it occurs outside of its native range, the adult beetles primarily attack coconut palms by boring into the crowns to feed on developing leaves. It is also known to feed on bananas, sugarcane, pineapples, oil palms, and pandanus trees. The larval grub stage burrow into and feed upon decomposing mulch and vegetation. On most Pacific Islands it lacks natural predators, leading to severe declines and extirpations of palm species where it has become established. On Guam, researchers have recently documented a shift of CRB to the island's native and threatened cycad tree (*Cycas micronesica*) (Marler et al. 2020). In the Hawaiian Islands, CRB is a documented threat to archipelago's native *Pritchardia* palm species.

For more information about CRB including the current situation in Guam and high/low-risk areas on O‘ahu, please visit http://cnas-re.uog.edu/crb/ or https://www.crbhawaii.org/.
To reduce the risk of spreading CRB, the following biosecurity protocol is recommended:
Biosecurity Protocol for CRB used on O‘ahu (most can be applied to Maui)

1. Never transport green waste between islands and minimize the creation, storage, and transport of green waste within O‘ahu, this also includes:
    a. Mulch, bark, compost
    b. Soil of any kind
    c. Potted plants of any kind

    Additional consultation is recommended if the project involves transportation of materials, soil, equipment, vehicles, etc. between islands.

2. If felling or trimming palms, contact CRB Response for a free inspection ((808) 679-5244 or email at info@crbhawaii.org)

3. Keep green waste whole until it is ready to be treated and removed.
    a. Chip green waste on site and transport it on the same day to a secure and managed green waste disposal site/facility.

   b. For chipped green waste in high-risk areas, re-chip prior to movement outside the infested area, treat with pesticide (when applicable), heat treatment (>130 degrees F), spread and dry, or store in sealed durable containers.

4. Minimize accumulations of green waste by regularly treating mulch piles or depositing it in sealed green waste bins. In low-risk areas, we also recommend thinly spreading mulch (less than 2 inches deep) and allowing it to dry (no irrigation).

5. If injured or dying coconut palm trees are observed or if CRB are detected, contact CRB Response at (808) 679-5244 or email at info@crbhawaii.org or online at https://www.crbhawaii.org/report.

From:	no-reply@wspis.com
Sent:	Tuesday, April 8, 2025 6:02 PM
To:	Small, Matthew; Liebowitz, Peter; Bents, Jamie; honoapiilanieis@online.wspis.com; Mitchell, Andrew
Subject:	New Comment from HonoapiilaniHwyImprovements.com

First Name: Andrew
Last Name: Viloria
Email Address: andrewv9@hawaii.edu
Join Mailing List: False
Comment:
Aloha, I recognize this may be too late, but as a lifelong citizen I do not want this highway to cut through our only outdoor flat open firing range. It would make the inaccesibility of sport shooting that much more difficult for Hawaii citizens. Please reconsider these changes. Mahalo, Andrew

Comment Log Submission No. 85

New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Tue 1/28/2025 5:46 PM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>; Mitchell, Andrew <Andrew.Mitchell@wsp.com>

First Name: cesar
Last Name: martin del campo
Email Address: cesarivangarcia@gmail.com
Join Mailing List: False
Comment:
Support for Honoapi'ilani Highway Improvements Project and Request for Correct Categorization of Parcel 48002115 To: Hawai'i Department of Transportation (HDOT) Subject: Public Comment on Honoapi'ilani Highway Improvements Project – Build Alternative 1 Dear Project Team, I am writing to express my support for the Honoapi'ilani Highway Improvements Project and its goals to improve transportation infrastructure while addressing environmental and safety concerns. I appreciate the effort and planning involved in designing a project of this scale to benefit our community. However, I would like to address a critical issue regarding the classification and evaluation of Parcel 48002115, which has been flagged for full acquisition under Build Alternative 1. It is essential that the property's current and planned uses are accurately reflected in the project documentation to ensure an equitable and informed process. 1. Misclassification of Parcel Use The current project documentation categorizes Parcel 48002115 as "not in use," which does not accurately reflect its status. Specifically: The parcel is actively utilized for grass farming operations, supported by established water connections and other agricultural infrastructure. Farming activities are currently underway, generating revenue and contributing to the agricultural economy of the area. Additionally, the lot is being developed with architectural plans for a residential structure to complement its agricultural use. This active farming operation and planned development demonstrate that the parcel is a valuable and productive asset, rather than idle or undeveloped land. If you have any questions, please contact me at (202) 746-0133. Cesar El Toro Zoysia Turf - Maui Grass Farm LLC.

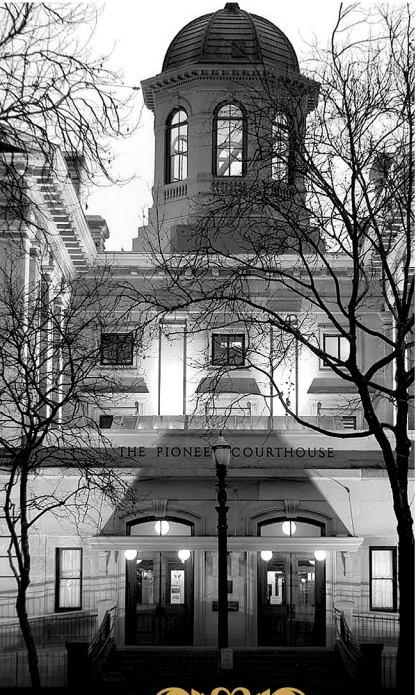
New Comment from HonoapiilaniHwyImprovements.com

From no-reply@wspis.com <no-reply@wspis.com>
Date Tue 1/7/2025 1:33 PM
To Small, Matthew <Matthew.Small@wsp.com>; Liebowitz, Peter <Peter.Liebowitz@wsp.com>; Bents, Jamie <Jamie.Bents@wsp.com>; honoapiilanieis@online.wspis.com <honoapiilanieis@online.wspis.com>

First Name: Lee
Last Name: Chamberlain
Email Address: lachamb91@gmail.com
Join Mailing List: True
Comment:
Dear Hawai'i Department of Transportation (HDOT) and Federal Highway Administration (FHWA), I am writing to express strong support for the integration of the West Maui Greenway (WMG) into the Honoapi'ilani Highway realignment project. The WMG, as part of the Hele Mai Maui Legacy Projects, offers a unique and timely opportunity to promote sustainable, multimodal transportation that strengthens resilience and community connectivity in West Maui. 1. Strategic Implementation of Segment 6 The WMG Final Report (September 2022) identified Segment 6 (Olowalu to Lahaina Pali Trailhead) as a priority due to its potential to repurpose the existing Honoapi'ilani Highway. Alternative A was evaluated as the top-performing route, benefiting from its scenic views, strong recreational connections, and the minimal need for new right-of-way (ROW). By utilizing the existing highway, this option is not only cost-effective but also highly feasible, despite its location within the sea-level rise (SLR) exposure area. 2. Compliance with the Navahine Settlement Commitments The WMG supports the Navahine Settlement's requirement to expand multimodal transportation infrastructure, including pedestrian pathways and bikeways, to reduce vehicle miles traveled (VMT) and support decarbonization goals. • Public Transit, Pedestrian, and Bikeway Expansion: The WMG aligns with interim goals for multimodal projects that integrate alternative transportation options across the state. • Specific Deadlines: Key elements, including pedestrian and cycling infrastructure, are to be incorporated into the planning and budgeting cycles starting by April 2025, in line with the Mid-Range Transportation Plan (MRTP) and the Statewide Transportation Improvement Program (STIP). • Budgeting Prioritization: Projects such as the WMG that align with decarbonization and VMT reduction goals will be prioritized, with a five-year timeline set for completion of key multimodal infrastructure expansions. 3. Integration with Complete Streets Policy The Complete Streets policy requires all transportation projects to prioritize the safety and accessibility of all users, including pedestrians, cyclists, and transit riders. • Policy Integration: The WMG is a model project for implementing Complete Streets, ensuring safe pedestrian and bike pathways, public transit access, and roadway infrastructure improvements that support walking and cycling. • Complete Streets Assessment: Beginning with the April 2025 planning cycle, all Capital Improvement Projects (CIPs), including the WMG, will undergo a Complete Streets assessment to document adherence to these principles. Any exceptions must be justified to ensure transparency and accountability. • Expenditure Prioritization: The WMG's focus on multimodal connectivity positions it for prioritization within the Complete Streets framework, ensuring that it receives the necessary funding and resources to move forward. 4. Alignment with Act 131 and the Hawai'i Bike Plan The WMG aligns with Act 131's mandate for a fully multimodal, accessible, and sustainable transportation system, as well as the Hawai'i Bike Plan's goals

of creating a statewide network of protected bikeways. Act 131 emphasizes the importance of separated pathways that improve public safety, health, and quality of life, all of which are central to the WMG's design. 5. Environmental and Permitting Benefits By repurposing the existing highway, the WMG may qualify for a Categorical Exclusion (CE) under 23 CFR 771.111(f) due to its minimal environmental impact. This reduces the need for extensive environmental reviews and allows for faster implementation while maintaining compliance with state and federal environmental standards. 6. Public Health and Emergency Preparedness The WMG contributes to improved public health outcomes by encouraging active transportation and providing equitable access to safe, recreational spaces. Additionally, the greenway can serve as a non-motorized evacuation route during emergencies, supporting West Maui's resilience and emergency response capabilities . Recommendation: I respectfully urge HDOT and FHWA to incorporate the West Maui Greenway into the Honoapi'ilani Highway realignment plan by repurposing the existing highway for Segment 6. This approach will maximize cost-efficiency, adhere to state and federal policy goals, and enhance West Maui's safety, resilience, and community connectivity. Thank you for your commitment to building a sustainable and resilient transportation future for West Maui. Sincerely, Lee Chamberlain Maui Bicycling League Advocacy Chair

DEIS Public Hearing Transcripts



HONOAPI'ILANI HIGHWAY IMPROVEMENTS
WEST MAUI, UKUMEHAME TO LAUNIUPOKO

PUBLIC HEARING PRESENTATION:
DRAFT ENVIRONMENTAL IMPACT STATEMENT

HELD ON

THURSDAY, JANUARY 23, 2025

5:00 P.M.

HELD AT

LAHAINALUNA HIGH SCHOOL

980 LAHAINALUNA ROAD

LAHAINA, HAWAII 96761

PUBLIC HEARING PRESENTATION:

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PUBLIC COMMENTS

TAKEN ON

THURSDAY, JANUARY 23, 2025

5:00 P.M.

MR. KAM: My name is Allen Kam. I'm from WSP. We're really happy to see you all here tonight. Happy to see you guys enjoying the open house. We're going to have that open until about 6:00 p.m. We're going to start to have a little presentation at 6:00 p.m. In the meantime please go and check out all the information that's over here.

(Public Comments:)

MS. EMMERICH: Hi, my name's Kellee Emmerich. I have been a Lahaina resident for almost 40 years. We owned a home on Lahainaluna Road. And during the Lahaina Fire we lost our home. One of my children, my daughter, and her family also lost their home in Wahikuli.

And after living in -- at the Hyatt for eight months we were -- it was very healing to move to Ukumehame. We bought a property in Ukumehame. And we put two tiny houses there, which we are

farming now. We have chickens. We planted over 20 trees. And we have a barn that we're going to be building.

And so it would be very inconvenient and disappointing if -- the higher up the highway was, it would be possibly affecting our property. And so my request is that it goes as low as possible through County land rather than through the resident -- or the residential areas or the agricultural areas or, yeah, private property.

I'm concerned also about the noise from the road noise. The closer up it comes to the -- where the people are living. So my request is that it would just stay as low as possible on the highway. I think that's it.

THE REPORTER: First and last name again?

MR. EMMERICH: Brad Emmerich.

THE REPORTER: Okay. Ready when you are.

MR. EMMERICH: So after the fire I realized that this is going to be something that takes a long time. And so I needed to find a house or something -- a place for my family to live. So that's when we lived at property there in Ukumehame.

I originally was trying to find a friend or something like that or somebody that was wanting

to allow me to put a -- either a mobile home or something on their property.

That's when somebody said, "Well, why don't you just look at the ones there in Ukumehame?" Which we had looked at earlier in the year but it was out of our ability.

Anyway, to make a long story short, so after the fire I realized it was going to take a long time before we could rebuild. So we went and found something there in Ukumehame.

And, like Kellee was saying, we were at the Hyatt for eight months. So while we were there we were working hard at trying to build something in Ukumehame. But it was difficult getting through all the process.

At any rate, now that we're there, of course, we really like the property and so we're more invested in what happens as far as the road is concerned. And there is property below us -- the property that's next to the highway that is all County property.

And there are no trespassing signs all over. But of course people have moved in there and, you know, they put up homesteads really -- gates and fences and right next to the "no trespassing" signs.

But it just -- it makes sense to me that the State would put the highway there at the County property at the bottom of Ukumehame development.

And then my other concern was the noise mitigation -- if there was a way that they could -- they would certainly -- my hope would be they would consider that because right now we can hear the highway noise.

But when we go inside, you know, then at least you can't hear it when you're inside. But if the highway was closer it gets louder. And so my hope would be that they would take that into consideration also since we are a resident -- that they would do something to try to mitigate the noise -- lessen the noise. That's it.

THE REPORTER: Perfect. Thank you.

(Break in audio.)

MR. ISHII: Hi, my name is Raymond Ishii. Is this thing on? Okay. I'm the president of the Valley Isle Sports Shooters Club, which is the oldest and largest user of Ukumehame Firing Range.

While I fully support moving the existing highway, in that there are a number of concerns I have. The roads appear to run parallel to fire lines, which we are very grateful for, although

there is a couple routes that were uncomfortably close. But my understanding is that's going to change.

The questions I have is right now to access the range and the Papalaua Wayside Park we have to drive past the range via the Viaduct exit to the Ukumehame subdivision, then backtrack on the existing highway.

The question I had, which was actually answered, was is the State going to maintain that highway to a correct standard where you can actually drive on it. And I was told that's going to be turned over to the County. So that's a County question now.

Because that section of road -- if anybody's driven it -- is probably going to fall in the ocean pretty soon. Because if you look every so often you'll see the -- basically the ocean undercutting the existing jersey barriers. So the question I have is, number one, is that road going to be maintained?

The second question I have -- to avoid that, prior on the left side of the bypass would it be possible to just simply restripe existing road and put in a turn lane so we can get direct access

and not have to basically bypass everything? That will give access to both the range and the beach park. Then, going back the other way, a merge lane.

My understanding is a viaduct is going to be 25 feet high, which is good so emergency vehicles can go under it. But the other question we had was during construction will people be allowed access basically to the range because they're going to build the viaduct over the existing road? And that's it for the range.

I have one comment though as far as the highway itself -- if there's any thought about putting protected passing lanes on that highway? Because if anybody's driven it, what happens is you get behind somebody going 20, 30 miles an hour and you got a line of cars, you know, half mile, mile long.

Then you get one guy ten cars back who's late for work and he's going to start passing people. So has there been any thought about putting passing lanes on that highway? Not the whole thing but just intermittently to let people around slow people. That's all I got.

MR. KAM: Mahalo, Mr. Ishii.

Mr. McPherson?

MR. MCPHERSON: Hi, my name is David McPherson. I live in Kipuka Village. Most people know it as Olowalu Village. I've been there for about ten years with my family.

As we look at the alternate routes, it seems -- and I would like to see it go a little bit higher away from the homes. There's a lot more space Mauka. Hopefully there's no park sites or anything that would be -- that would hinder that to be pushed further away from our homes.

We have a small little village there. And it seems like it goes, you know, fairly close. So that's one thing that I would really like to see happen is that it would be pushed further away from our homes for the noise.

And second of all, for the design team, if you thought about putting guardrails up -- I know guardrails are to stop cars when there's no other runways that they can slow down.

But guardrails keep vagrants out of State-covered lands. And that's a really -- putting guardrails up would save our County and State dollars in not having to clean up cars.

I mean, if you do the stretch from Olowalu to Ukumehame you're going to see cars littered up

there, especially if you take a helicopter and you fly over. It is unbelievable. And that takes a lot of money, a lot of effort, and it damages our wetland areas.

So to keep everybody out of there, guardrails would eliminate anybody really driving into State-covered land or places that they should not be trespassing. That's just one thing that I wanted to say on that. Thank you, everybody, for coming. Appreciate it.

MR. WOLFORD: Good evening. My name's Jason Wolford. I'm with SAST. We're a nonprofit training organization at Ukumehame Firing Range. We're a nonprofit. We teach firearm safety and training.

My concern is along with the fires when the range was closed -- people need accesses through that. So during the construction are we still going to be able to access that? Because people want to go hunt. They need to be able to sight rifles in for ethical hunting purposes and things like that.

If it's shut down another six to eight months during the construction of that, you're just going to have people going other places shooting and as well as being able to take firearms, classes, and

trainings -- and safety trainings -- which is required by the State of Hawaii.

You're basically going to be locking people out of access to these constitutional rights as well if we don't have access to that.

And my second question is I understand they're making it three lanes for finances and things like that. What happens when there's an accident on that elevated roadway?

Whether there's guardrails and the vehicles are stopped there and people need to get through or -- how are you going to get people off of that? If there's a fatality we all know the road shuts down here for six to eight hours.

How are people going to get off of that elevated roadway to be able to at least go one way or the other to get back somewhere else rather than sitting in their cars for six to eight hours?

MR. FISCHER: Hello, my name is Van Fischer. I own six acres in Olowalu right where the wai stream goes up right below where the proposed highway is going to go through.

Fortunately, the new highway that's proposed barely clips the corner of my property. So I'm grateful that it misses mine. But my neighbors

are not so fortunate.

I'm here to ask you to move the intersection of Luawai and the highway Mauka, like, 150 feet for a number of reasons. One, the way that it hits Luawai Street now is at an angle so it doesn't create a right-angle intersection.

So you're going to have to realign the side roads as opposed to realign the highway. If you just move the proposed highway up about 150 feet it changes the arc of the highway as it comes through.

And then it hits Luawai Street at a right angle so you have a proper intersection. That intersection's going to need to be signalized because it's going to be a very busy intersection going down into Olowalu Village.

Another issue is that on the back of our property lines -- Lot 20 and Lot 19 -- there's a subservice tributary to Mapua Stream.

And there's an old pumphouse right where you're putting your highway through where if you go down in there you can see there's water flowing under there. And that is a tributary into Mapua Stream, which runs right through mine and Dave's property just down further.

The rest of Mapua Stream up above is also subterranean. But in the section through our property it's an open stream and there's tons of life in there. And we would like to protect it and enhance it if possible. And putting the highway through there is not going to accomplish that.

There is a substantial topography difference between the area where the highway can go right above Lots 19 and 20 as opposed to below. There's about a 12-foot vertical bank. And if it were moved up then you wouldn't have to deal with that bank.

If you do have to deal with the bank, behind my property's going to be a 20-foot-high embankment to support that highway up there. So for these reasons I'd like to ask that you move it.

The most important reason probably is that right where you go through Lot 20 there was two parcels there -- A and B -- just on the southside of the wai stream where there was two two-and-a-half-acre parcels there with two local families who are in contract to buy those to build their homes on.

And now they can't build their homes there. You're going right through those properties. And all it would take is to move it 150 feet Mauka

into an open space tract that's already there that nobody's going to be building on.

So I would appreciate it if you would look into it. I feel really good. I spoke with Jamie about this and I feel like she really understood and cared about what I was saying. So I'm hopeful that you will take this into consideration. Thank you.

MR. NIELSON: Hello, my name is Nick Nielson. I'm a property owner in Ukumehame. Most of my concerns have been addressed so far so I'm just going to note one concern for us. We're kind of concerned about the hours of construction -- if there's going to be limits or it's going to be a 24-hour operation and how that noise will be addressed and recorded before and after construction. Will there be a decibel meter at our location now and that's compared to construction? That's it.

MS. KEAHI: Aloha. I'm Malihini Keahi. I'm from Lahaina all my life. You know, my dad was Moon Keahi. And my father used to help a lot of representatives who were trying to make a change on the west side.

And the craziest thing was that every time they wanted to add a road something else was coming. So again, you know, I live in Leali'i. I spoke my

piece up there. I think what I'm afraid of more so is the highway.

So you take up more land. You open up the highway. And then you infringe on people in Olowalu. Some of them are wanting the changes. But you know what? I think leave Olowalu as peaceful as it is.

It doesn't stop traffic to come into Lahaina. Today I had an appointment on the other side. I came back this way. Traffic was backed up on the bypass. And I think the more road you make the more people come.

And with what Lahaina has just already gone through it's, like, this is too much. It's just too much. I think Lahaina, Olowalu needs to be rethink -- I know they were wanting to make a whole village and a whole town.

That place is sacred. I think the few people that know about it and the people that have learned about it in this last 20 years is plenty enough. We need to speak -- we need to share the history of Olowalu, not condemn it because we're going to have more people coming in.

You know, that area -- it's been sacred for me all my life growing up. Whenever we were

gathering with my grandmother there we'd always end up down by Olowalu Pier and we would spend a week or a month, especially when my grandparents were alive, and we'd all gather.

Everybody who was from Pu'ukoli'i on this side of the island -- we'd go to Olowalu. That is gone now. Yeah. My babies grew up there. My grandbabies today -- they don't -- they enjoy it there because of the feeling and as we grew up there.

But Olowalu is special. And those of you that are there, you're very blessed. And I just feel that this whole highway thing -- and I know progress is progress. But, like I said, every time we add a road something else is happening. It gets developed.

All the work that Tanya did of exposing our history is going to be covered all over again. Maybe not all the areas, but most of it -- of her hard work, of our past.

And that is today that is going on -- that we get to know of our past, our history. For our children and our grandchildren and our great-grandchildren -- they'll never see that. It's going to be covered. And you add one more road --

that's not going to help.

You know what? After the fire, traffic was very little. People respected and got only on the bypass through Lahaina and Keawe. And that got all messed up, yes.

And then we asked these two, "Why couldn't you do the road Mauka and take it to Honokowai?" We said no more money. But you talk about money. So why don't you work on that part? You know, above --

MR. KAM: Three minutes is up. Please wrap up.

MS. KEAHI: So, anyway, I didn't mean to come talk but I had to say something. And I have my family Naho'oikaikas Olowalu and I was really worried where that road was going to change because they're right above the store. And that's why I'm here.

MS. KEELE: So mahalo to having this in Lahaina. I think that's really helpful. I want to recognize that, Director Sniffen, you've done this a couple times now. So thank you -- coming to the community to have conversations.

I'm happy to see so many people from the area that we're discussing because I found out about this meeting because I opened my, like, Lahaina

Strong weekly email today. So they happened to have it in there.

And so just advertisement wise if there's something better that you guys could do for future engagement because our community is really overwhelmed. And so we need to have a little bit of notice so we can plan around things.

I do want to acknowledge that in the presentation it looks like someone did realize it since you had these printed because on the boards it does say "a grassy median" and that made me very uncomfortable. So I want to make sure that we are talking about that as a native plant median and not a grassy of some sort.

And then just engagement wise, you know, I'm just kind of wondering, like, how you've done it and how much you've done because this is something that, especially on Maui, we've found is that we just -- there just isn't really engagement.

People say there's engagement and, like, yeah, some people go the meetings but, like, it's always the same groups of us that do. And I appreciate the explanation of the preferred versus the alternatives. I think that was really helpful.

I do think that cultural concerns is very

-- it's a very significant conversation for us to have. You know, we know that there's going to be Iwi where we're talking about.

And so having a plan for that -- because my understanding is, like, the state law, like, doesn't exist about it. Like, you find Iwi and you stop. And that's, like, the law. So, you know, just being mindful of those kind of things because we know that's going to happen.

And then to Dave's point, I really liked the comment about the guardrails. And I also enjoyed the comment about the passing lanes.

And I don't know that that's necessarily an option, but I do think that at the very least we should have signs that say, like, pull over to let other cars pass or something because that absolutely happens. And I think encouraging people to drive faster around isn't great.

But letting people know, like, "Hey, you're driving too slow -- get out of the way" is, like, very helpful to those in our community who have to commute every day and deal with all these tourists. And I think that's really it. Otherwise, everything's been covered. So mahalo for having this.

MS. KALUNA-PALAFOX: Aloha. Good evening. My name is Victoria Kaluna-Palafox. I live in Ukumehame. I am and we are Ukumehame restoration wetlands and restoration of Limu projects working in Ukumehame. Also working with Olowalu.

We pray that we connect with our ohanas here in Lahaina so that we can continue the growth of Limu to renourish our oceans again and to protect our wetlands. And with that, Ukumehame for many, many years has been very dry. The wetlands has had no life until a couple years ago.

If you go to Pohaku Aeko Street there's, like, a culvert they made. Over there it used to be all dry. The only time that wetlands used to fill up is when the rains used to come and a little seepage from the ocean floor.

Today in that culvert there's water in there and there's fishes. There is life right where you're thinking of putting that highway. I ask you not to do it.

I ask you to go ahead, bring your scientists, and check our 'Aina Ukumehame because it's coming alive again. There is fishes where you wouldn't think there is fishes. There are water pools in Ukumehame where there weren't water pools.

It is starting to show us.

There was one developer -- and the only developer back there -- he tried to help the community by building eight cottages. In order to get their cottages built he covered up a wetland pool and put the eight houses on it.

My question to you -- how are you going to run your highway? With a big berm or are you doing dry pipe? If it is dry pipe I am against dry pipe because the wetlands are important for us, especially at this time.

We need to start concentrating on growing food for our people. And this is where it should be -- Ukumehame Olowalu -- the largest land in Lahaina. Open, barren, good 'Aina for grow food.

The other part that I am very concerned about is all the wetland pools. There's a special one that I talked to Tanya and I talked to Pua today. It was always kept within the Kupuna's, Mana', and Mo'olelo. We have not shared that space yet.

As Olowalu has a cave up in the valley filled with water and that land belonged to the Nahina and Ho'oikaika's, today Peter Martin wants to funnel that water out.

Ukumehame is the same. It is a land of food growth. We need to look into that history. The wetlands of Ukumehame starts from the pipe and it comes almost all the way to the river.

The reason why I'm saying almost to the river is because the river's water flow comes within that passage so the wetlands could stop at one certain point. Again --

MR. KAM: Your three minutes --

MS. KALUNA-PALAFOX: Yeah. Again I will repeat -- many years from the time of the first development that area was all wet. Within the last year or so water has been seeping under the road. Kane has found his way, therefore bringing the fishes back to where they was in time past. I thank you very much for the time.

MS. MAGALLANES: Aloha mai kakou. My name is Linda Nahina Magallanes. I'm an original descendant of Olowalu -- my biggest concern. I know a lot of culture is significant in that area.

I had asked about cutting down the trees through Olowalu -- the tunnel trees. I was told they cannot. Why? You protect the trees but you're not protecting the cultural significance of Olowalu.

Every bit of Olowalu is significant

culturally. I know that because I'm also from Olowalu with the connection of my ohana Naho'oikaika and Keao. I used to live where the farm is right now that -- by the highway -- that coconut farm and butterfly -- I lived there until we moved into Lahaina.

But my biggest concern is if you put the road up higher what about the heiau on the top? That heiau is still going strong. There's also Pu'u Kilea, which is -- our Kupunas are buried on top. You're going to put one highway through that.

You have Awalua, which is the outskirt of Olowalu on the Lahaina side. Then you've got Kapa'i, which is on the Wahikuli side of Olowalu. So also these places need to be named correctly. Not -- Kapa'i is not Olowalu. That's Kapa'i.

I said this in many meetings. I came to many meetings. I also was on you guys' Zoom meeting and somebody said they was going to get back to me and to today never got back.

It really disappoints me because nobody listened because it's all about the road. If you cut the trees down, you got one road there. Use the old cane haul road. What's so hard about that?

Instead of going up -- because even on the

cane haul there's -- the cane road to the regular road has cemetery on the left. Check West Maui Land EIS and put that together with your EIS. Something will go right. That's all I got to say.

I'm kind of angry and I'm sorry by coming out like this. But nobody listening to the people who from here of Maui, of Lahaina, in Olowalu. I'm very upset because nobody listens. They're just doing what they like, put roads where they like, but not listening to the people -- listening to the money. Thank you.

MR. KALUNA-PALAFOX: I'm from Ukumehame We're the first ones that you guys gonna plow through, you know, and come into our kuleana. That's like taking a part of our livelihood. Even through how much you guys coming through, but you still coming through our kuleana. It was two generations.

For me hard because now we feel like we are losing out again, you know, the kanaka -- always the ones to lose all their -- especially for a generation. You know, how much more the kanaka people got to lose?

You know, it's already there. It's already stated. We're impacted. Land Commission

awards but they no accept one TMK over that. You know, we become a loser again. You know, we suffering already with what we get.

We see all our beaches being destroyed, being used as recreation. Ukumehame is a recreational park. Outsiders come do surf lessons and the instructor is just as White as the person that came off of the plane.

You know, I could see with a local, but no. So our land is being used as a recreation. Economy. You can make money. What about the people that already is suffering -- all the kanaka? You got to fight for Lahaina.

How is that? My wife -- generations, two generations. How come she got to fight just to stay on our land? Plenty kanaka kawai got to fight for our land. We already fighting for our water so we can make money.

The hotels, the greedy ones, sucking all up the water. But the people suffer with 20 percent of water. How is that? Even the kanaka -- they get first rights automatic -- first rights no questions asked. They get the right for the water, for the 'Aina.

You cannot just come through and think you

own and just plow through all our cultural sites or our wetlands or the river and life. I mean, I'm pure Filipino. My dad came from the Philippines. My mom born here.

But my heart is so kanaka. And I cry about all of that because I know all these kanakas out here is suffering. They're suffering. You know, I know it's hard for me. I got to see all this with my own eyes.

I mean, I'm 66 years old. I watch Maui from when I was born in to today how things look is all messed up. You know, I sorry. But the County and the State -- they making it more kapulu. You come with the machine, plow any kind, don't even -- you, sorry, but half-ass -- kapulu.

MR. KAM: That's about time.

MR. KALUNA-PALAFOX: I'm sorry. But mahalo. I hope they will get to you guys. You know, you guys -- we the first families. You guys coming through -- you know, I'm sorry. I no like you guys come through my property and my -- it's not my property, my kuleana.

And my great-great-grandkids behind me -- I'd like them live the same life as me. So fix the old highway. You guys will save a lot more money by

just fixing it. Mahalo.

MS. FELICE: You kind of just, I guess, nipped it in the bud by saying that you're not going to build a highway up north because we don't have the funding. Right? But we need another way out of Lahaina. If you were here during the fire you would understand.

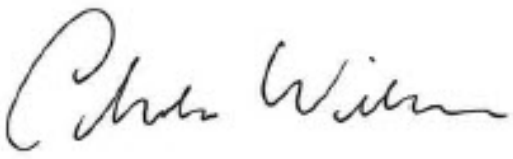
(Public comments concluded.)

CERTIFICATE

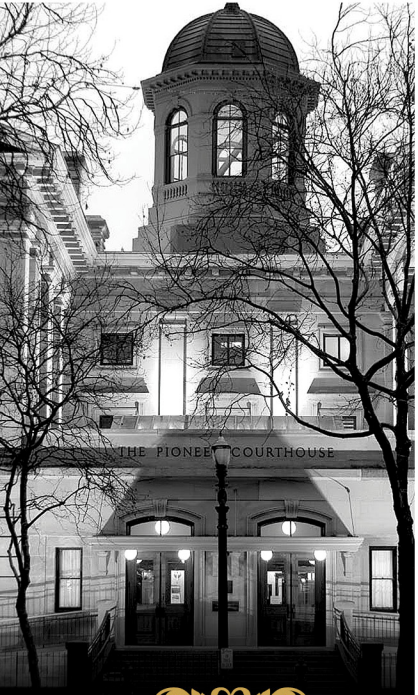
I, Chelsea Wilhelm, do hereby certify that I reported all proceedings adduced in the foregoing matter and that the foregoing transcript pages constitutes a full, true and accurate record of said proceedings to the best of my ability.

I further certify that I am neither related to counsel or any party to the proceedings nor have any interest in the outcome of the proceedings.

IN WITNESS HEREOF, I have hereunto set my hand this 10th of February, 2025.



Chelsea Wilhelm, #3541



HONOAPI'ILANI HIGHWAY IMPROVEMENTS
WEST MAUI, UKUMEHAME TO LAUNIUPOKO

PUBLIC HEARING PRESENTATION:
DRAFT ENVIRONMENTAL IMPACT STATEMENT

PUBLIC COMMENTS

TAKEN ON

TUESDAY JANUARY 28, 2025

5:00 P.M.

PUBLIC HEARING PRESENTATION:

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PUBLIC COMMENTS

TAKEN ON

TUESDAY JANUARY 28, 2025

5:00 P.M.

MS. HALLEY: My name is Nancy Halley. I've been a resident of Maui for 40 years and I have listened to discussions about moving the highway back for a long time. It's been going on for a long time, so I've kind of excited about that. I could see how it could really benefit the island.

I did have a question and I haven't read the EIS statements, I haven't read the paperwork yet so I really need to do that; and I will do that. But I was wondering about things that came into my mind were, you know, when all the -- unfortunately, all the -- the debris was moved to the Olowalu dump site and after the Lahaina fires and Bissen, Mayor Bissen, said that that will also be transported over to the Central Maui Landfill at one time.

And so I'm just kind of wondering in my mind I was thinking how is that going to impact these plans for the highway? There's been concern

about the dump site -- the current dump site possibly leaching into the coastal waters off of Olowalu; and so I'm just kind of wondering.

And then this whole movement of transport trucks moving back and forth to get to the Central Maui Landfill, so I'm just kind of wondering how that all ties into your EIS.

Have you taken a look at that and do you think that your highway proposal would affect that in some way environmentally or, you know, I still have some questions about that.

MR. DEL CAMPO: Okay. It seems like the preferred alternative -- I know it's still not the final, but it seems like our property will be impacted in the Ukumehame subdivision. I was just wondering if there's going to be someone contacting us to understand the level of impact to our farming operations or who would be the best person for me to contact in order to have a discussion?

MS. DIAS: Okay. Aloha. My name is Saman Dias and that is spelled S-a-m-a-n, last name D-i-a-s.

And I am a Maui -- West Maui resident and have been on Maui over 25 years on the west side. And I'm also the chair for Maui Bicycling League.

So I would like to first start with thanking the HDOT and FHWA and the consultants for a great job that you folks are doing. You are very appreciated.

Maui Bicycling League do not oppose to the realignment. However, we have -- we want to address some points to ensure part of the realignment that you folks do not forget the West Maui Greenway and all of you are very well aware and the community, as well. And Segments 3, 4, 5 and Segments 6 and 7 -- Segments 6 and 7 are getting affected by the realignment. Segments 3, 4, 5 also received recently acknowledgment for race grant, so this 6/7 is really important to us. We want to ensure that I'm calling it old highway after the new highway begins.

The old highway is getting realigned with Segments 3, 4, 5 and the connectivity will continue to connect 6, 7 to 3, 4, 5. So as part of the design of the old highway; it's important that we do not forget the West Maui Greenway 6 and 7; and it should be part of the design to incorporate the bicycle/pedestrian pathways specifically safe for our children, as well as for Kupuna. So do not forget that.

And, also, the new highway it is really

important that we incorporate somehow safe bicycling and pedestrian crossing. Very important, do not forget the pedestrian covered crossing to be incorporated to the new highway.

And you all are aware of the Navahine Settlement Agreement where HDOT has made commitments to reducing the carbon footprint and please use this as a opportunity to build that bike network that you all are supposed to complete in year 2030.

So these are just reinforcing, I have been talking to you folks on every opportunity. I also had sent testimonies and I'm just stating this opportunity as a way to remind again. And mahalo and thank you so much.

MS. COMCOWICH: Aloha. This is Karen Comcowich, K-a-r-e-n, C-o-m-c-o-w-i-c-h. I'm a West Maui resident. I drive the Honoapi'ilani Highway multiple times a week for commuting to and from work and I fully support this project because I see the wave impacts that are happening around the highway.

I would like to echo what Saman said that it's really important to have pedestrian access that goes across the highway and to ensure that the bicycle alignments are respected and that safe bicycling infrastructure is included in the plan.

I would also like to say that there should be a location where there's some sort of passing zone because one of the dangerous things that does happen is getting stuck behind visitors who are -- who are sightseeing while people are commuting, encourages people to pass in unsafe ways. So if there's just a passing zone so people can get around the slower drivers.

And past that, avoiding kuleana parcels as much as impacts the kuleana parcels as much as possible. I was impressed that archeological resources and the environmental resources have been thought about as much as they have in the plan.

And that's all my comments for now. I'll submit written comments.

MS. ROY: I'm agreeing with everyone else. I do drive the Pali a lot, like four times a week; and getting stuck behind slow drivers and then having crazy fast drivers trying to pass in the bad areas I think maybe widening the roads in certain areas for passing would be great.

And then also I just want to go on the record; I don't really -- I mean, I understand Route 3 and 4 just from looking at the maps, but they do worry me a little bit because they go by the

petroglyphs and recently the petroglyphs have been getting vandalized. And so I'm afraid it would kind of instigate more of that happening or maybe even roadblocks or traffic jamming up there from people pulling over to look; and that area doesn't really have a lot of parking space for people to be pulling over and looking at them.

So I'd ask you guys if you do go Route 3 and 4 to take that into consideration; and that's all I really have to say.

I do want to read up more on this. There's a lot to read up on. So -- but, yeah, that's all I'd like to say.

MR. POTTS: Okay. Yeah, so my name is Jason Potts, P-o-t-t-s.

Is there a way to ask questions on here or it's just for comments? Sorry.

MR. SHISHIDO: Yeah, you can go ahead and ask questions and I can answer.

MR. POTTS: Okay. My question was, like, with the -- the highway that's already there, specifically in Olowalu, what is going to be done with that? I haven't heard anything about that so I'm a little confused.

MR. SHISHIDO: Yes. So that would

probably get turned over to the County, you know, even when the other segments of Lahaina Bypass were constructed, you know, there was all that discussion with the County once there's, you know, a longer segment and we have dual parallel routes and the, like, existing highway would be turned over to the County.

MR. POTTS: Okay. And then my other question was I noticed on the map that the -- where was it? So it's your preferred build that's going to go through two of those large rock mounds from the old like sugarcane company, right?

I've been told that there's possibly bones in that, so what will be happen -- like, what will happen if you guys find bones during construction?

MR. SHISHIDO: So prior to construction, you know, we will be doing some sub-surface investigations.

You know, as I mentioned, there's going to be a programmatic agreement to address that and with all of that they will lay out the steps on what happens if you should discover any burials.

MR. POTTS: Okay. Perfect, yeah.

And I did submit testimony. It was through email. I'm not sure if you got it. My wife

did, also. Her family owns kuleana in the back near the petroglyphs, so hopefully, you got our testimony.

That's pretty much it. I just had those questions, so appreciate your time. Thank you.

(Public comments concluded at.)

CERTIFICATE

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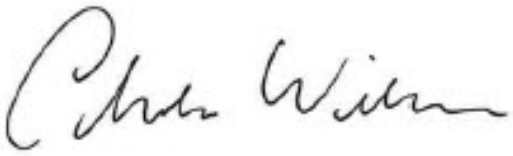
I further certify that I am neither related to counsel or any party to the proceedings nor have any interest in the outcome of the proceedings.

IN WITNESS HEREOF, I have hereunto set my hand this 11th day of February, 2025.



Chelsea Wilhelm, #3541

DEIS Public Hearing Presentation

ALOHA MAI

PUBLIC HEARING PRESENTATION: DRAFT ENVIRONMENTAL IMPACT STATEMENT

Honoapiʻilani Highway Improvements
West Maui, Ukumehame to Launiupoko

DEPARTMENT OF TRANSPORTATION · STATE OF HAWAII

U.S. Department of Transportation
Federal Highway Administration

JANUARY 23, 2025

Honoapiʻilani Highway Improvements

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Public Involvement,
WSP

Emily Engelbart
Public Involvement,
WSP

ʻĀina Archaeology

Tanya Lee-Greig
Lead Archaeologist,
ʻĀina Archaeology

Public Hearing Agenda

- Welcome
- Presentation
  - Public Hearing Process
  - Purpose and Need
  - Alternatives
  - Environmental Screening
  - Preferred Alternative
  - Draft EIS Document and Public Availability Period
  - Project Schedule and Next Steps
- Public Testimony

Public Hearing Process

- Public hearings are your opportunity to give FHWA and HDOT your thoughts.
- Public hearings are required for Environmental Impact Statements.
- Public hearings share project information.
  - Open House area is for questions and conversations with project team
  - Presentation area is for formal presentation and public testimony
- Public hearings allow opportunity to give public testimony or one-on-one testimony to a court reporter. These will be part of the EIS records and Final EIS document.
- Written public comments are also part of the EIS record and Final EIS document.
  - Submit written comments in Open House area
  - Submit written comments to team no later than February 24, 2025

Honoapi‘ilani Highway Improvements

Why This Project?

Emergency Repairs:

- Over the past 10 years, this stretch of highway has been repaired three times after storms and high waves.
- A fourth project is currently in development to address erosion near Olowalu.

HDOT Vulnerability Assessment Findings:

- 2019 Statewide Coastal Highway Report ranks Honoapiʻilani Highway at Olowalu (#2) and Ukumehame (#12) as most critical out of 300 sites for ocean hazard vulnerability.
- 2021 HDOT Climate Adaptation Action Report Exposure Assessments found 3.2-foot Sea Level Rise Exposure; Vulnerability to hurricane-related storm surge; and Hypothetical tsunami scenario identified in the project area.

Funding Opportunities:

- HDOT secured a $22 million federal RAISE grant with the help of our Congressional Delegation, Visitor Industry, FHWA, and Maui County
- Sen. Schatz helped to secure a $23 million earmark in the 2022 OMNIBUS Bill
- Total estimated cost for this project is approximately $160 million.

Project Purpose and Need Statement

The primary purpose of this Project is to provide a reliable transportation facility in West Maui and improve Honoapi‘ilani Highway’s resilience by reducing the highway’s vulnerability to coastal hazards.

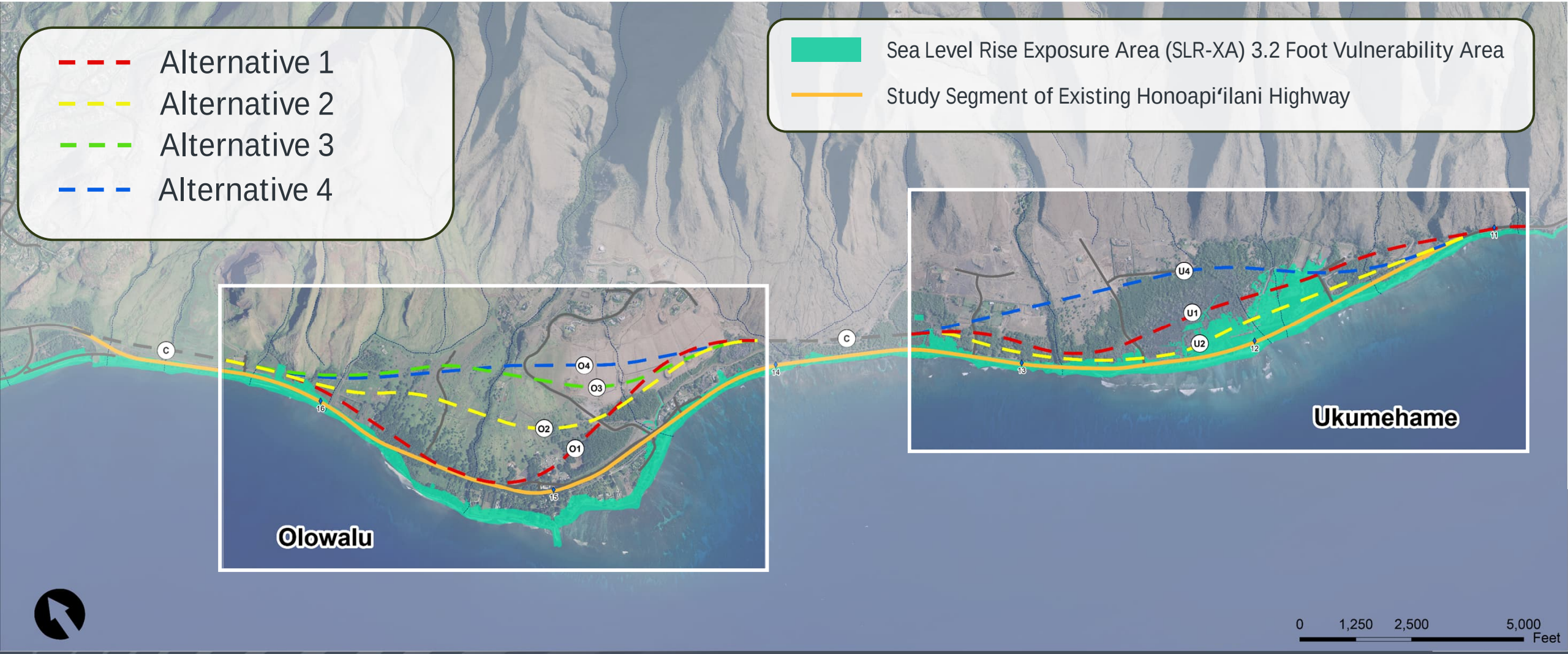
Specifically, the Project is intended to address existing coastal erosion and flooding, as well as future coastal erosion and flooding caused by anticipated sea level rise, as delineated by the SLR-XA along the stretch of highway from Ukumehame to Launiupoko, approximately milepost 11 to milepost 17.

Factors in Determining Preferred Alternative

- Best opportunity to avoid and minimize adverse effects.
- Refinements to the alignment specifically address:
  - Archeological and cultural locations
  - Areas with wetlands/waters
  - Areas with known threatened and endangered wildlife
- Best accommodates environmental commitments and mitigation
- Minimizes private property acquisition

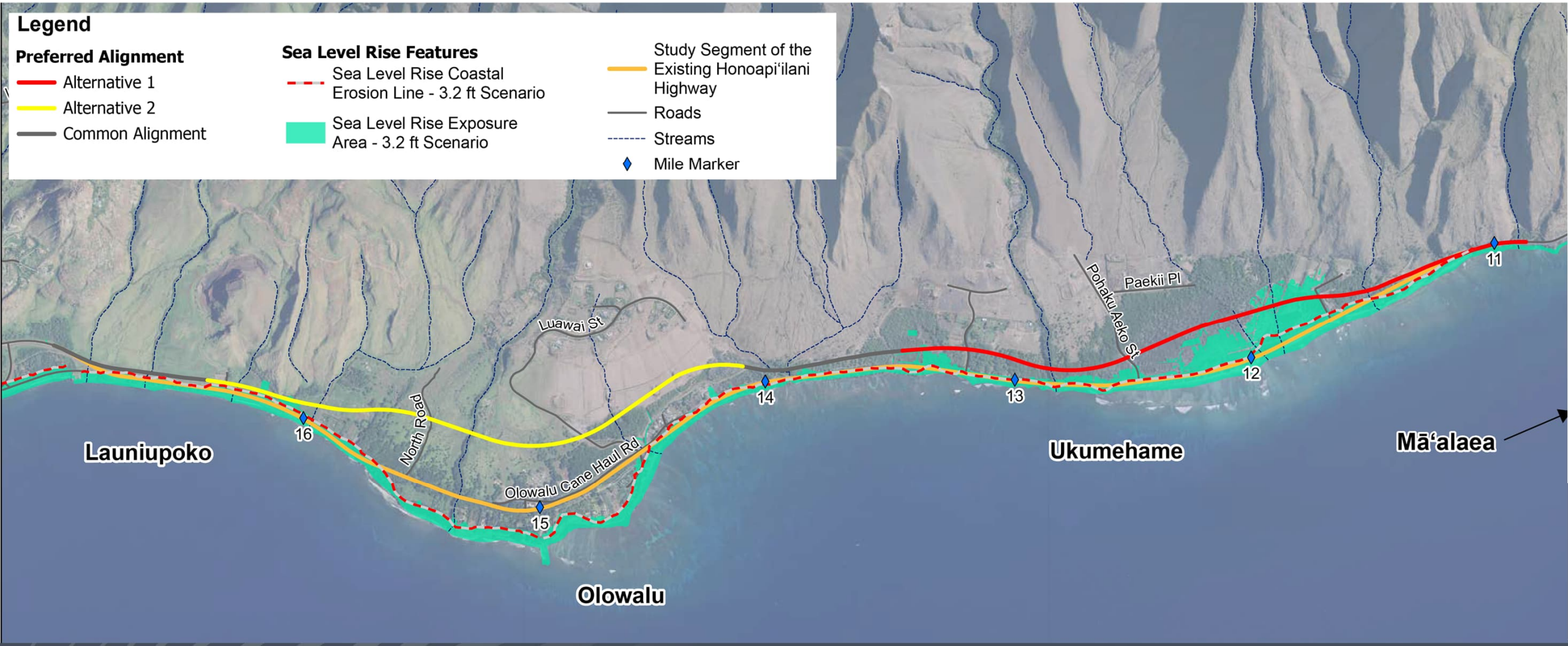
- Best opportunity to meet Purpose and Need while minimizing impacts

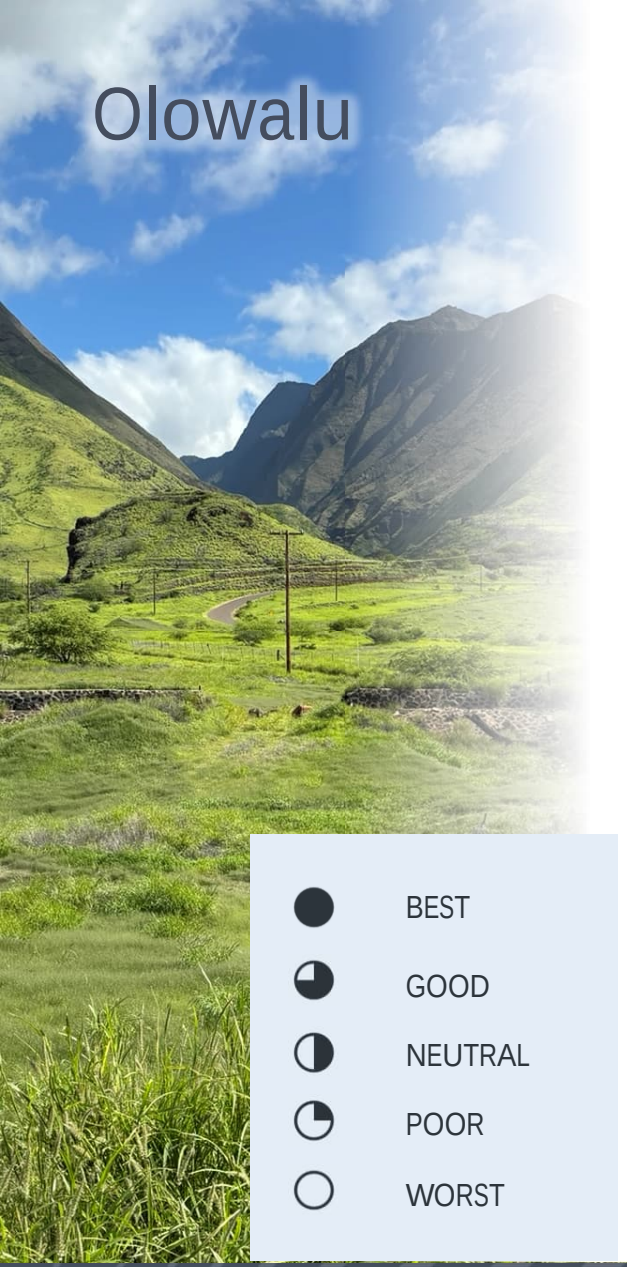
Project Alternatives



Honoapiʻilani Highway Improvements

Complete Preferred Alternative





TOPIC	NO BUILD ALTERNATIVE	BUILD ALTERNATIVE 1	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	PREFERRED ALTERNATIVE
Preliminary Construction Cost Estimates	◕	◑	◑	◑	◑	◑
Land Use and Zoning	◑	◕	●	◕	◕	●
Agriculture and Farmlands	◕	◕	◕	◑	◑	◕
Community Services	◕	●	●	●	●	●
Land Acquisition, Displacement, and Relocation	●	◑	◑	◔	◔	◑
Parklands and Recreational Resources	●	◕	●	●	●	●
Archaeological and Architectural Historic Properties	●	◕	◕	◕	◔	●
Cultural Resources	●	◑	◕	◑	◔	●
Visual and Scenic Character	◑	◑	◕	◑	◔	◕
Water Resources, Wetlands, and Floodplains	○	◕	◕	◕	◕	◕
Flora and Fauna, Endangered Species	◑	◕	◕	◕	◕	◕
Geology, Soils, and Natural Hazards	◔	◕	●	●	●	●
Coastal Zone Management/Hawai‘i Special Management Areas	○	◕	●	●	●	●
Climate Change and Sea Level Rise	○	●	●	●	●	●
Transportation	○	◕	●	●	●	●
Air Quality and Energy	◕	●	●	●	●	●
Noise	◑	●	●	●	◔	●
Infrastructure and Utilities	◕	●	●	●	●	●
Hazardous Materials	●	◕	●	●	●	●
Environmental Justice	◕	●	●	●	●	●

● BEST

◕ GOOD

◑ NEUTRAL

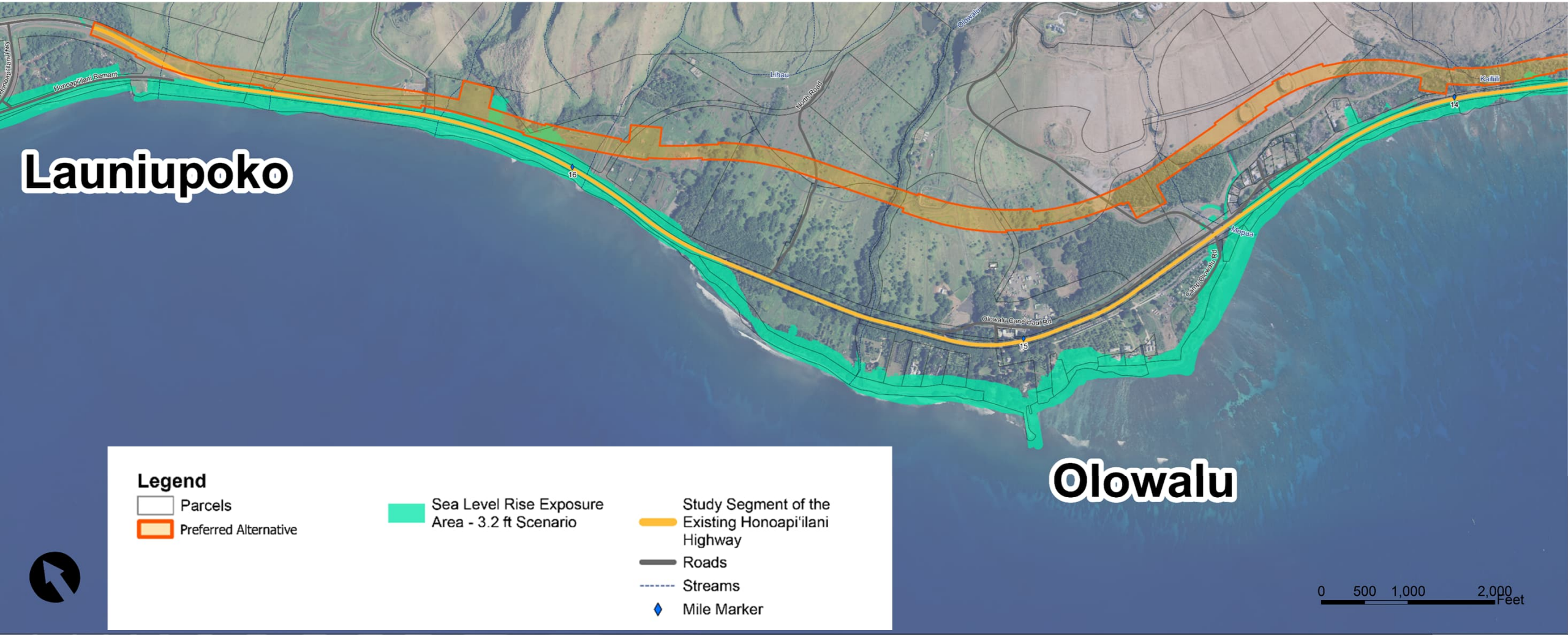
◔ POOR

○ WORST

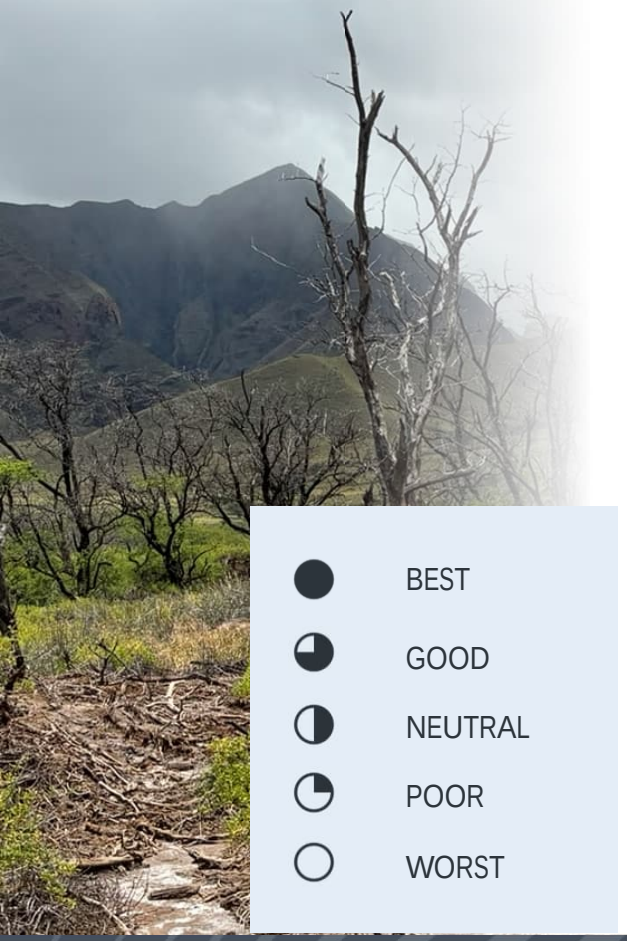
Alternative Impact Evaluation and Screening

Honoapi‘ilani Highway Improvements

Olowalu Preferred Alternative (Alternative 2)



Ukumehame



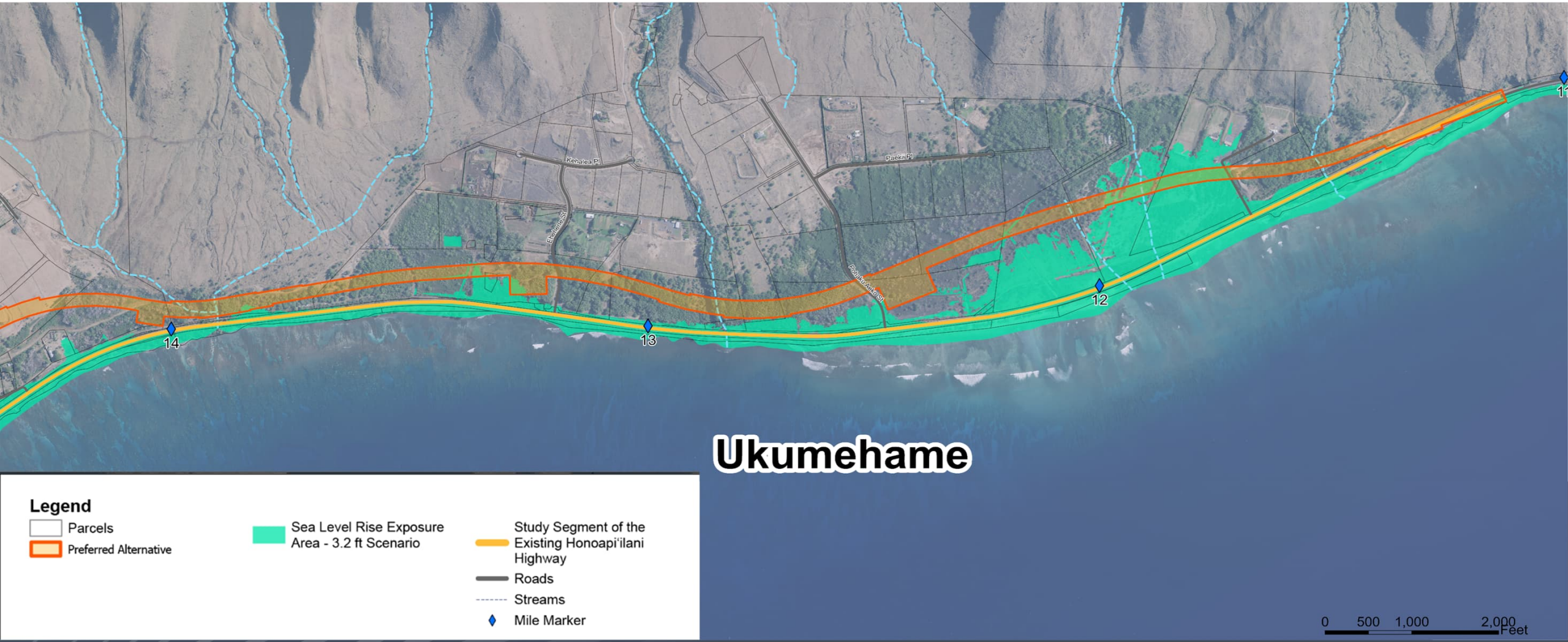
- BEST
- GOOD
- NEUTRAL
- POOR
- WORST

TOPIC	NO BUILD ALTERNATIVE	BUILD ALTERNATIVE 1	BUILD ALTERNATIVE 2 AND 3	BUILD ALTERNATIVE 4	PREFERRED ALTERNATIVE
Preliminary Construction Cost Estimates	GOOD	NEUTRAL	NEUTRAL	NEUTRAL	NEUTRAL
Land Use and Zoning	NEUTRAL	BEST	BEST	POOR	BEST
Agriculture and Farmlands	GOOD	BEST	BEST	POOR	BEST
Community Services	NEUTRAL	BEST	BEST	BEST	BEST
Land Acquisition, Displacement, and Relocation	BEST	GOOD	GOOD	WORST	GOOD
Parklands and Recreational Resources	GOOD	BEST	BEST	BEST	BEST
Archaeological and Architectural Historic Properties	BEST	POOR	NEUTRAL	NEUTRAL	BEST
Cultural Resources	BEST	POOR	NEUTRAL	NEUTRAL	BEST
Visual and Scenic Character	NEUTRAL	GOOD	GOOD	POOR	GOOD
Water Resources, Wetlands, and Floodplains	POOR	NEUTRAL	WORST	GOOD	NEUTRAL
Flora and Fauna, Endangered Species	GOOD	BEST	BEST	BEST	BEST
Geology, Soils, and Natural Hazards	POOR	GOOD	BEST	BEST	BEST
Coastal Zone Management/Hawai‘i Special Management Areas	WORST	BEST	GOOD	BEST	BEST
Climate Change and Sea Level Rise	WORST	GOOD	POOR	GOOD	GOOD
Transportation	WORST	BEST	BEST	BEST	BEST
Air Quality and Energy	GOOD	BEST	BEST	BEST	BEST
Noise	GOOD	BEST	BEST	GOOD	BEST
Infrastructure and Utilities	GOOD	BEST	BEST	BEST	BEST
Hazardous Materials	BEST	BEST	BEST	BEST	BEST
Environmental Justice	NEUTRAL	BEST	BEST	BEST	BEST

Alternative Impact Evaluation and Screening

Honoapi‘ilani Highway Improvements

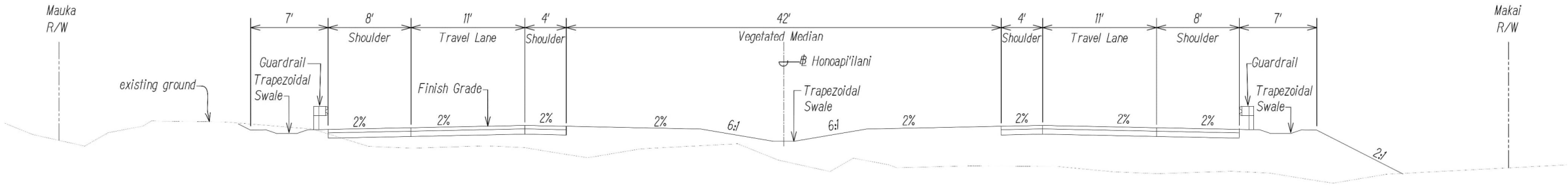
Ukumehame Preferred Alternative (Alternative 1)



Design Elements

Basic Design Elements Include:

- 45 MPH posted speed limit
- 11-ft wide travel lanes
- Paved shoulders (4-ft min. at median, 8-ft outside)
- Guardrails where appropriate
- Wide vegetated medians (for improved safety and stormwater management)
- Acceleration / deceleration lanes at intersections
- Infiltration/detention ponds

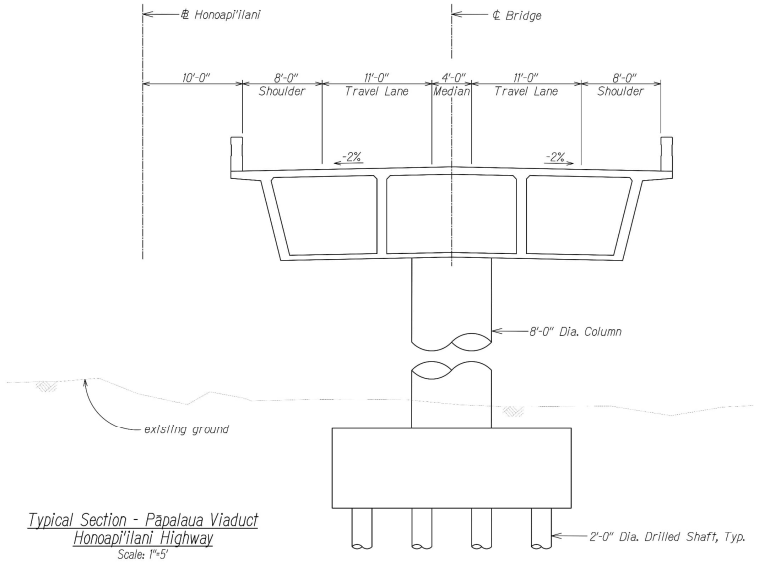


Primary Typical Section - Two Lane with Wide Vegetated Median
Honoapi'ilani Highway
Scale: 1"=5'

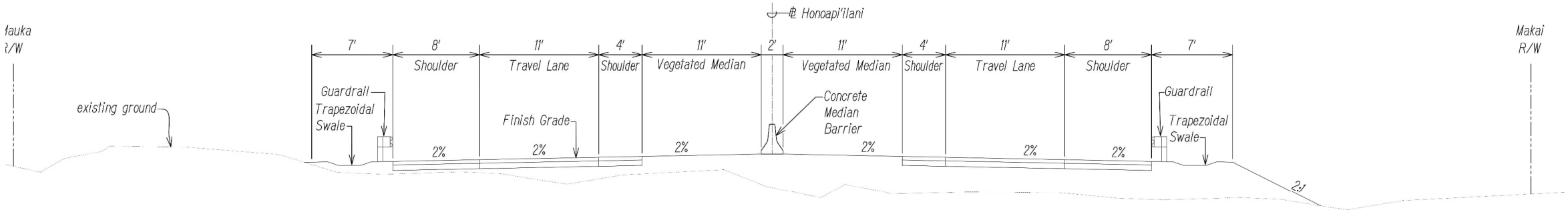
Design Elements

Variations in Design Elements Include:

- Narrower medians (to reduce footprint for preservation of archaeological and historic resources)
- Viaduct in Ukumehame (to span over sedimentation pond and wetland areas)
- Street lighting only at intersections



Typical Section - Pāpalaua Viaduct
Honoapi'ilani Highway
Scale: 1"=5'



Pinch Point Typical Section - Two Lane Narrow Vegetated Median
Honoapi'ilani Highway
Scale: 1"=5'

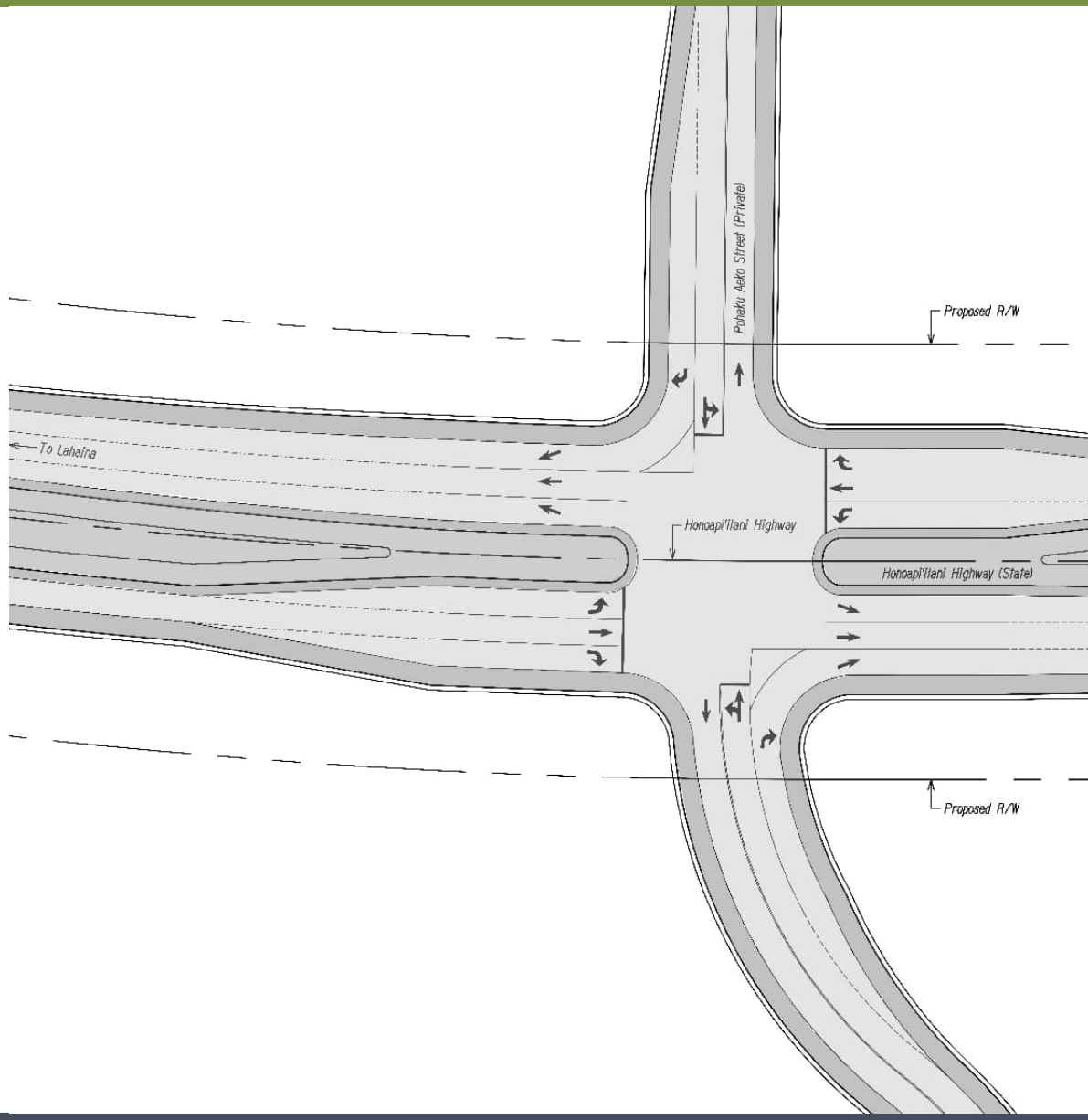
Design Elements

Typical Intersection Elements Include:

- Acceleration/deceleration lanes
- Turning lanes on main highway
- Streetlights

Proposed Intersections:

- Olowalu Recycling Center
- North Road
- Luawai Street (signalized)
- Ehehene Street
- Pohaku Aeko Street



Topics Included in this Environmental Impact Statement

Social, Economic, and Built Environment

- Land Use
- Land Acquisition, Displacement, and Relocation
- Agriculture and Farming
- Socioeconomic Conditions
- Environmental Justice
- Parklands and Recreational Facilities/ Beach Access
- Infrastructure and Utilities
- Hazardous Materials
- Visual and Scenic Character

Cultural and Historic Resources

- Archaeological and Architectural Historic Properties
- Cultural Resources and Practices

Natural Resources

- Geology and Soils
- Water Resources and Wetlands
- Flora and Fauna / Threatened and Endangered Species
- Natural Hazards
- Coastal Zone Management, Hawai'i Special Management Areas
- Climate Change and Sea Level Rise

Transportation

- Transportation Systems
- Pedestrian/Bicycle Use
- Air Quality
- Noise

Construction Impacts

Indirect and Cumulative Impacts

Other Environmental Studies Highlights

Historic and Cultural Resources
Section 106 / Chapter 6E

- Above ground surveys of archaeological and architectural resources have been completed
- The draft programmatic agreement has been drafted, but is not yet final
- Subsurface research will be completed on the preferred alternative before construction

Parks/Rec and Historic Sites
Section 4(f)

- The Draft EIS assessed several properties for Section 4(f). Only the Ukumehame Firing Range, was eligible for Section 4(f)
- The Ukumehame Firing Range is anticipated to have a "de minimis" (minimal) impact from the Preferred Alternative. This will be coordinated with the County of Maui
- A Section 4(f) de minimis evaluation will be included in the Final EIS.

Wetlands and Water Resources
Section 404

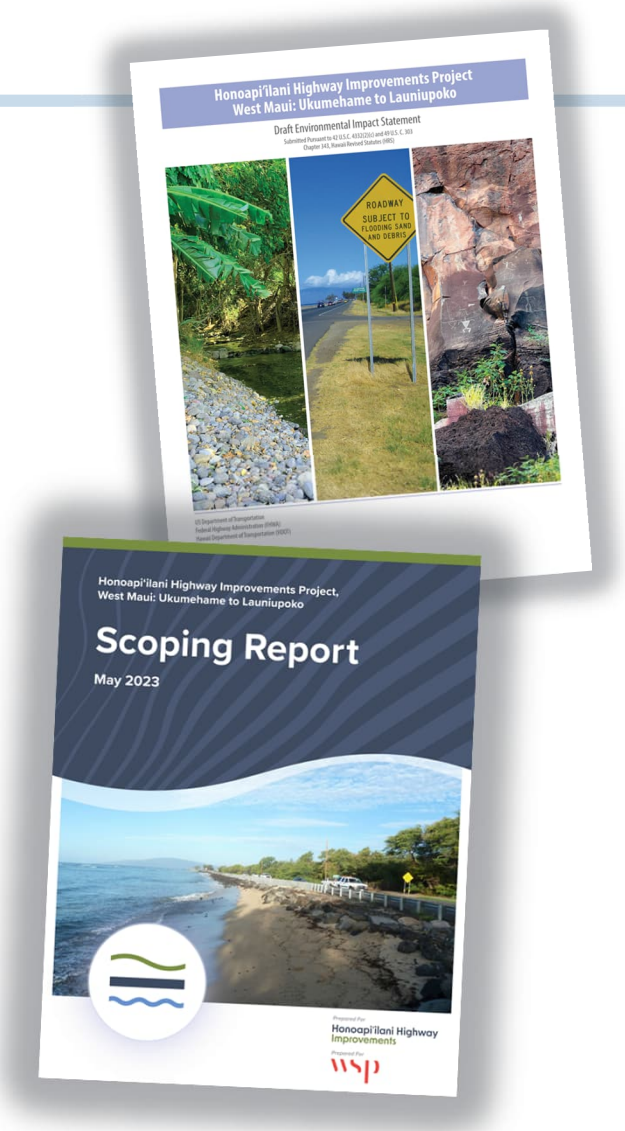
- Water features in the study area include approximately 21 acres of delineated wetlands
- Permanent impacts for the Preferred Alternative are not anticipated to exceed 0.1 acre in any delineated jurisdictional wetland.
- Compliance with Clean Water Act is ongoing through coordination with U.S. Army Corp of Engineers. Permitting will be completed during the next phase of the project

Endangered Species
Section 7 / Chapter 195d

- Two listed species observed:
  - nēnē (Hawaiian Goose)
  - ae'o (Hawaiian Stilt)
- Endangered species consultation is ongoing with USFWS. Consultation with NOAA-NMFS has been completed
- Next steps: Determine final species protection measures with USFWS

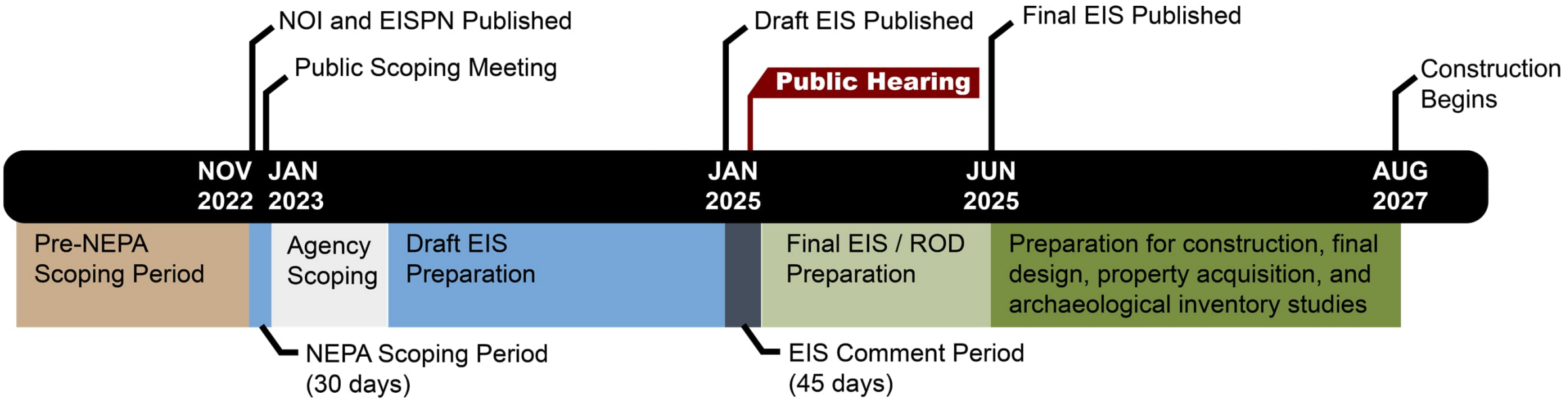
EIS Timeline

December 2021 to November 2022	Pre-NEPA/ HEPA early scoping period
November 22/23, 2022	Notice of Intent and EIS Preparation Notice
November 30, 2022	Scoping letters sent to agencies explaining the project and requesting input
December 2022	Three public scoping meetings, comment period closed December 31, 2022
May 2023	Scoping Report Published
August 2023	The Lahaina wildfire did not physically affect the highway project area; however, the environmental review timetable was extended by 10 months.
January 2025	DEIS Publication
January 2025	Public Hearings (comments due February 24, 2025)
June 2025	Anticipated FEIS/ROD Publication



Schedule and Next Steps

- Public Comment on Draft EIS ends on February 24, 2025
- Final EIS/Record of Decision expected June 2025



Providing Testimony or Comments

Provide comments in several ways:

- Verbal public testimony after project presentation
- Verbal one-on-one testimony to court reporter in designated area
- Written public comment via paper form in comment area
- On-line written public comment via website
- Email to honoapiilaniEIS@online.wspis.com

TO PROVIDE COMMENT SCAN HERE

Honoapiilanihwyimprovements.com

FHWA

@ Richelle.Takara@dot.gov

Federal Highway Administration, Hawaii Division
Attention: Richelle Takara, Division Administrator
Box 50206, 300 Ala Moana Blvd., Room 3-229
Honolulu, HI 96850

HDOT

@ Ken.tatsuguchi@hawaii.gov

Hawaii DOT Planning Branch
869 Punchbowl Street, Room 301
Honolulu, HI 96813-5097

Comment period is open until February 24th, 2025

Honoapi'ilani Highway Improvements

MAHALO

Now: PUBLIC TESTIMONY

- Meeting attendees will have 3 minutes each to share their comments
- Please come forward when your name is called to give testimony
- Please be respectful of others
- The meeting is scheduled from 5 p.m. – 8 p.m.

Questions or Comments?
Contact: Ken Tatsuguchi,
Project Manager, HDOT
Ken.tatsuguchi@hawaii.gov

Honoapi'ilani Highway Improvements