KUHIO HIGHWAY (ROUTE 560)
HISTORIC ROADWAY CORRIDOR PLAN

2005

A vision of the future derived from the riches of our past . . .

Department of Transportation
State of Hawaii

KUHIO HIGHWAY (ROUTE 560)
HISTORIC ROADWAY CORRIDOR PLAN

Hanalei, Kauai, Hawaii

2005

Department of Transportation
State of Hawaii

Prepared by
Belt Collins Hawaii Ltd.

With Contributions from
Kuhio Highway (Route 560)
Community Advisory Committee

TABLE OF CONTENT

LIST OF FIGURES

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
CAC	Community Advisory Committee
CSD	Context Sensitive Design
DLNR	Department of Land and Natural Resources, State of Hawaii
FHWA	Federal Highway Administration
HDOT	Department of Transportation, State of Hawaii
NHPA	National Historic Preservation Act of 1966
M.P.	Mile Post
NSBP	National Scenic Byways Program
NRHP	National Register of Historic Places
SHPD	State Historic Preservation Division, State of Hawaii
SOI	Secretary of the Interior, U.S.
SRHP	State Register of Historic Places, State of Hawaii

I. INTRODUCTION

This planning document has been developed to provide the Hawaii State Department of Transportation (HDOT), Highways Division, Kauai District, with a framework for decision making and actions on Kuhio Highway, Route 560.[1] It focuses on a specific concept for the highway involving rural-historic road design intended to protect the corridor's natural and historic conditions and characteristics. The provisions of this document do not apply to all HDOT highway facilities, but only to the Kauai District office and the management and operations of Route 560.

The preparation of this plan represents a collaboration of efforts by the HDOT, government and public officials, business representatives, and community leaders and includes an implementation strategy that is unique to Hawaii in highway transportation planning.

The plan outcome is the result of:

1) context sensitive design (CSD) that included a comprehensive review of the entire roadway corridor and public participation through community outreach sessions, public meetings, and ad hoc advisory committee workshops;

2) HDOT's willingness to take on the challenge of being responsive to the special needs of the local community, while fulfilling its responsibility to provide a safe and efficient transportation facility; and

3) HDOT's acceptance of the challenge to implement new operational and design policies in an environment of existing standards.

The HDOT Kauai District office will specifically use this document as a working plan to provide the necessary direction for current and long-term actions regarding preservation, rehabilitation, restoration, reconstruction and improvement, and repair and maintenance work on Route 560 over the next 25 years.

This plan addresses the needs for road pavement, shoulders, bridges, road accessories and signage improvements or preservation, maintenance upgrade, and implementation of emergency/relief operations. This plan is not intended to recommend specific improvement projects or an associated development schedule or timetable. It is primarily to provide structure, general priorities, and design and development guidelines for various types of work within the highway corridor as funding for the work becomes available.

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[1] Funding for this project was provided by the State Transportation Planning Fund, which authorized the preparation of this plan under Project No. SPR-0010, Contract No. 47976.

II. BACKGROUND

Kuhio Highway, Route 560, is a two-lane rural highway that extends from Princeville to the end of the road in Haena on the North Shore of Kauai. Approximately 10 miles in length, Route 560 passes through Hanalei, Wainiha, Haena, open fields, taro lands, mountainous coastlines, and scenic areas.

Through the years, the region has experienced continued growth and become a major visitor attraction. This growth has stirred a steady increase in traffic on the highway. Today, the vehicles are bigger, faster, and heavier than the vehicles that traveled the right-of-way in the early years of the last century.

In 1968, HDOT obtained jurisdiction of Kuhio Highway, Route 560, from the County of Kauai.[2] During the ensuing years, HDOT performed primarily repairs, maintenance work, and minor improvements to the right-of-way. These efforts, however, have not addressed the increased demand for safer and more diligently maintained facilities, nor followed a structured policy consisting of an overall plan for long-term right-of-way improvements.

Although there is pressure to upgrade Route 560 to current standards, there is considerable interest by the community to retain the road in its present rural form. Originally constructed in the early 1900s as part of a "belt road" system for Kauai, Route 560 is still largely intact today (in terms of alignment) and one of the last representative examples of the old circle island facility. With few exceptions, Route 560 has retained a significant portion of its original features and characteristics, including its narrow lanes and shoulders, winding path, one-lane bridges, concrete ford crossing, and timber and masonry guardrails. Route 560 also crosses the Hanalei River, which is one of only fourteen "American Heritage Rivers" in the United States.

The physical presence of Route 560 is a defining element of the Hanalei-Haena region, and its specific features reflect the various characteristics of the area. Special studies, including historic, archaeological, cultural, and scenic, among others, were conducted to document the important qualities of the road.

Recognizing Route 560's historic stature in the region, the Hanalei-Haena community has embraced and supported the historic road concept and long-term preservation of the highway and its bridges. This strong community sentiment has lead to pro-active efforts in assuring that the historic qualities of the road are protected.

In 2003, Route 560 was approved for placement on the Hawaii State Register of Historic Places (SRHP). In 2004, the same facility was placed on the National Register of Historic Places (NRHP). Placement on the two registers has provided both local and national recognition to Route 560 as a historic feature.

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[2] A small portion of the route traverses privately-owned land.

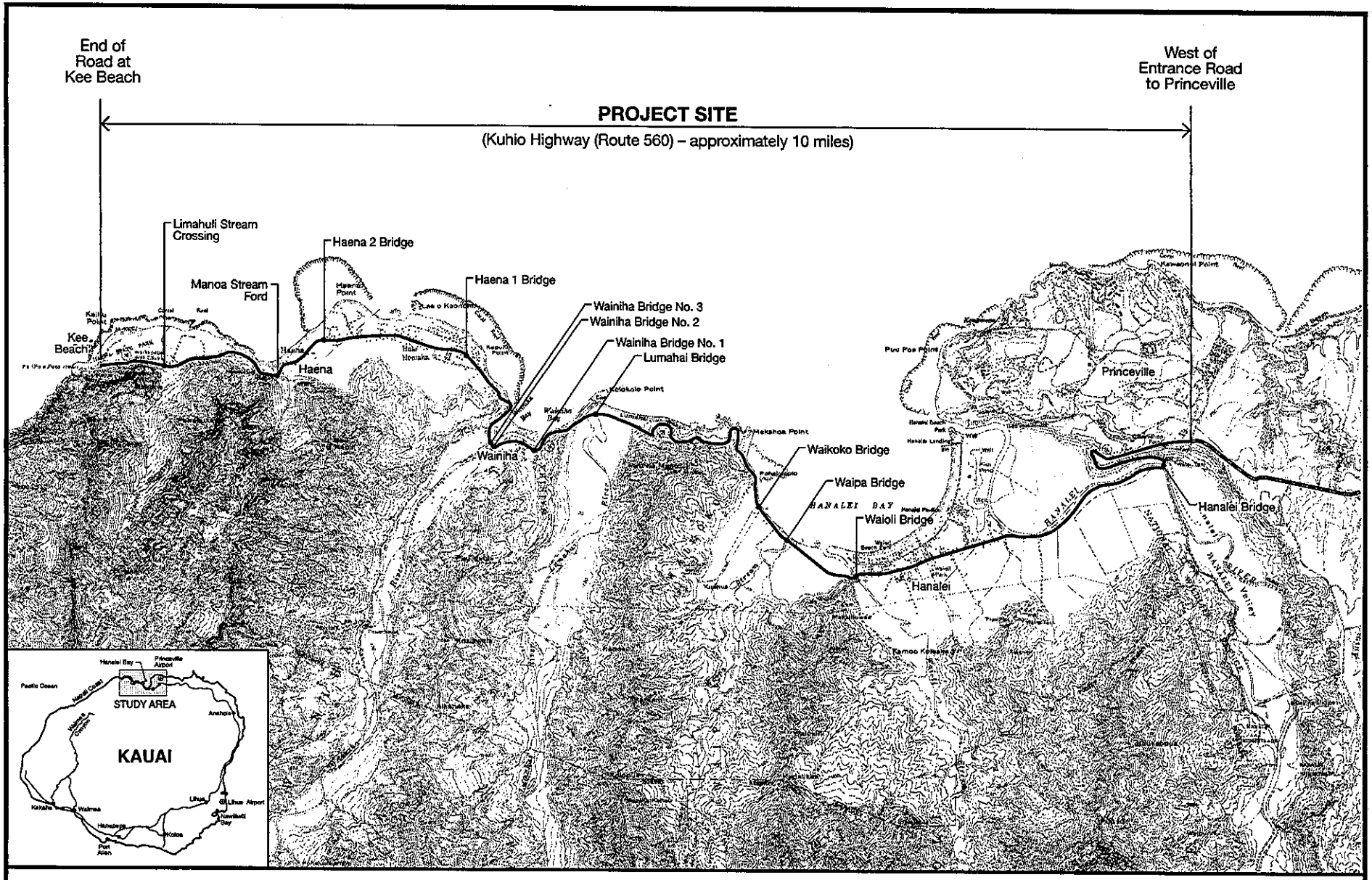


Figure 1
PROJECT LOCATION

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii

In addition to its historic qualities, the County of Kauai recognizes Route 560 for its scenic value. The current Kauai General Plan[3] designates the highway as a scenic roadway corridor that importantly contributes to the rural and visual character of the area.

The County's North Shore Development Plan also recognizes Route 560 for its scenic beauty. The highway with its view planes to the surrounding lands provides a consistent and memorable travel time for the motorist. It is this special encounter with the local setting that draws island residents and visitors, alike, to the North Shore for a "real Hawaii" experience.

Route 560 is the only road currently providing local access through the Hanalei-Haena community while also serving as part of the statewide highway system. In the past, these two seemingly competing highway functions (local access vs. statewide highway system) have generated conflicts in management and operations of the State road and its associated facilities. In particular, various interest groups have placed differing weights on such matters as preserving the local area's historic, cultural, natural, and scenic resources, while equally recognizing HDOT's need to provide a safe/efficient highway and addressing the agency's potential tort liability issues. These concerns have resulted in well-attended meetings and intense discussions between State transportation officials, business representatives, community leaders, and local residents.

Community participation has become an important mainstay in highway transportation planning. A significant change in transportation practices, theories, and policies have evolved into a process known as "context sensitive design" (CSD). In this inclusive comprehensive design approach, numerous national models have been developed that demonstrate how safety and management of historic and scenic highways can be accomplished. CSD has particularly demonstrated that historic preservation and highway safety are not necessarily mutually exclusive concepts.

From the inception of this project, the Hanalei-Haena community has been recognized as a vital component in the Route 560 planning process, and its involvement has played a major role in the preparation of this document. With the community's participation and contribution in this process, this planning document has attained enormous credibility with the area residents and worthiness for support in the long-term.

[3] Adopted in 2000 by County of Kauai.

III. THE VISION

The Vision of this plan for Kuhio Highway (Route 560) is:

- To develop a community-based planning document utilizing CSD to provide responsiveness and sensitivity to the region's residents, environment, and historic background and culture, and to provide a safe and efficient transportation facility.

- To review and identify the resources and essential qualities of the region, both man-made and natural, and embrace their meaning and importance to the community in relation to the highway corridor.

- To recognize the value and importance of Route 560 to the community and region, and the need to take appropriate actions for its treatment and maintenance.

- To review and account for the long-term transportation needs of the highway over the next 25 years.

- To consider that Route 560 and its various components be a single, interwoven, and inviolable resource. Such an approach will require inter-agency and community coordination at every level.

IV. THE OBJECTIVES OF THE PLAN

In recognition of the historic value of Kuhio Highway (Route 560) and the desire of the community to retain the physical elements of the facility in its existing form, it is the objective of this plan to maintain the intrinsic qualities of those features while addressing the issues of transportation safety and efficiency.

The Kuhio Highway (Route 560) corridor plan will include general policies, design guidelines, and implementation measures for the HDOT Kauai District. It will be a planning document that builds on previous and current planning objectives reflecting a community consensus that consciously balances the concerns of safety, mobility, and the preservation of historic, scenic, aesthetic, and environmental resources and community traditions.

In retaining the historic value of Route 560, certain physical elements of the corridor will not conform to existing highway design standards as currently interpreted and applied. An objective of the plan is to make use of the flexibility provided by the range of options incorporated within existing design standards, and apply other options, as necessary, that would allow HDOT to implement the plan's various policies.

A challenge for the plan is to develop an implementation strategy that utilizes:

- o the flexibility allowed under HDOT's existing design standards (primarily American Association of State Highway and Transportation Officials' [AASHTO] "Green Book" and Hawaii Statewide Uniform Design Manual for Streets and Highways and Standard Plans).
- o design exceptions for specific highway elements or features.
- o a comprehensive, thorough, and consistent highway policy encompassing all aspects of design and function. The plan, among other things, would ensure a high level of safety for the traveling public, and serve as a legal tool to demonstrate that safety considerations have been weighed thoughtfully, thoroughly, and comprehensively.
- o documentation of decision procedures to demonstrate how the plan policies, that required judgment among permissible choices, were implemented.
- o opportunities in federal and state programs that provide applicable design standards support and special funding.

The HDOT, hence, will require creative measures for implementation as well as support and assistance from elected officials and the community.

V. STUDY METHODOLOGY

The original scope of this project was to develop a comprehensive roadway corridor plan for Route 560 with a 25-year planning horizon. The planning process initially involved the traditional methodology of data gathering, information analyses, identification of problems, evaluation of potential solutions, selection of preferred improvements, and preparation of implementation strategies. After completing the preliminary phases of the project and engaging in public input, it was apparent that the predominant preference of the community was for minimal change and preserving many of the qualities that make Route 560 special.

At the various community outreach sessions, personal interviews, and public meetings, residents repeatedly expressed their desire to maintain the highway's rural characteristics, protect its historic, cultural, and scenic qualities, and retain its one-lane bridges. These strong sentiments subsequently refocused the project to a rural-historic road concept that called for special provisions, including non-conforming design parameters and features currently not being used by HDOT.

To review and assess these new design parameters, in depth, a community advisory committee (CAC) was assembled which included an HDOT official, community leaders, government agency representative, business leaders, and elected official (see Appendix A). The CAC was tasked to engage in a series of solution-seeking meetings to develop recommendations that would bring the rural-historic road concept to life. At the

conclusion of the meetings, the recommendations from the CAC were presented at a fourth public meeting in Hanalei for final public review and comment.

The new rural-historic road concept for Route 560 evolved through the use of CSD and the flexibility in highway design standards. The planning process included public participation by various sectors of the community and a product that is the result of strong collaboration and support by those involved. This collaborative effort will continue to be needed as the plan is implemented over the long-term.

VI. CHARACTER-DEFINING QUALITIES OF ROUTE 560

The notable qualities that make Route 560 worthy of its designation as a historic road are its historic, rural, cultural, and scenic attributes (see Figures 2, 3, and 4). It achieves state and local significance in the areas of engineering, transportation, and social history. The construction of the road and its bridges between 1900 and 1957 was a major transportation achievement.

Additionally, under the criteria established by the SRHP and NRHP, Route 560 is recognized as a historic facility for its association with events that have made a significant contribution to the broad patterns of the island's history. It is an embodiment of the distinctive type, period, and method of construction for that time in history.

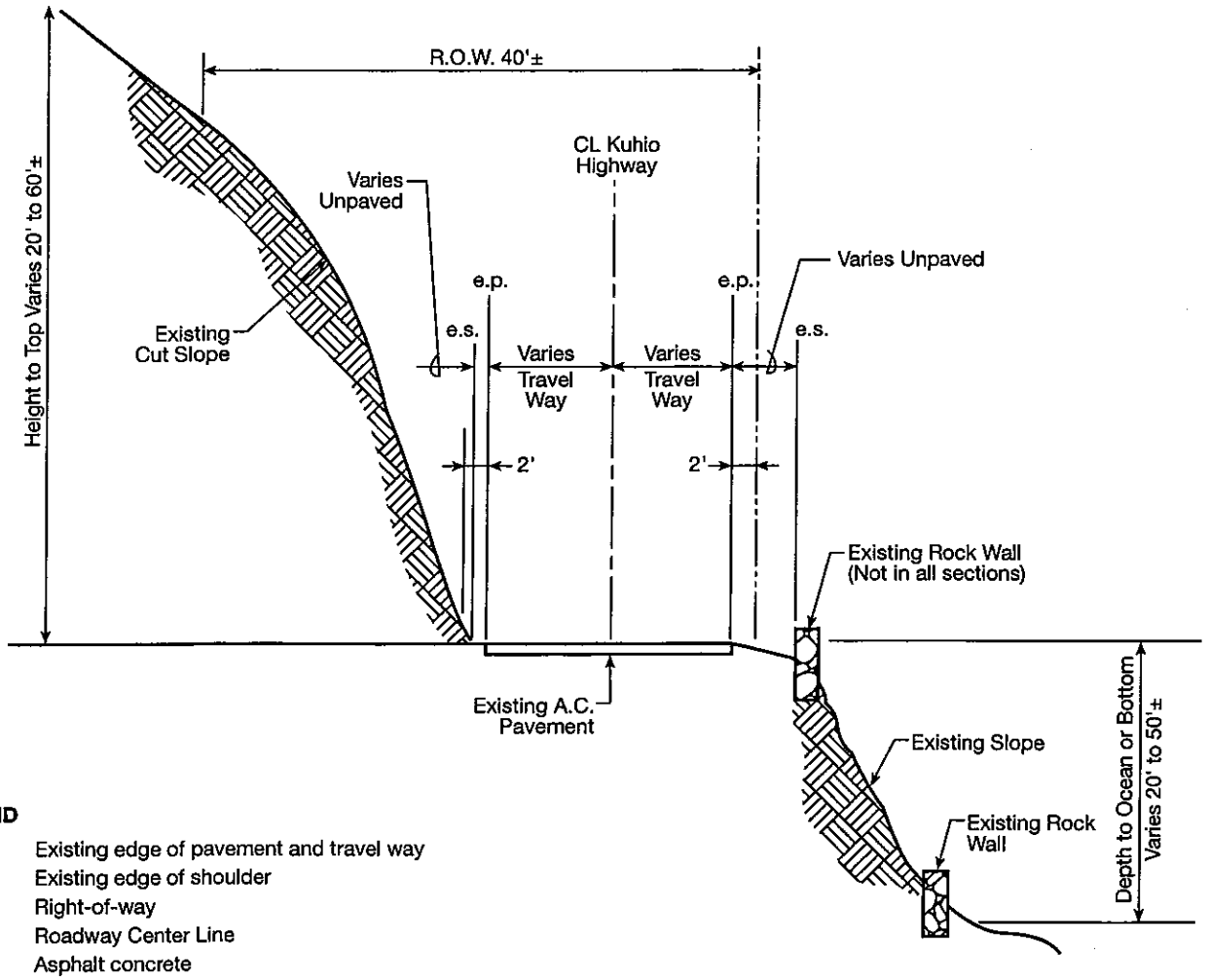
Placement of Route 560 on the SRHP and NRHP gives it immediate recognition as a significant historic resource. It also mandates State Historic Preservation Division (SHPD) review of HDOT's actions on the highway corridor when federal funding or permitting is involved, and provides eligibility for various support and funding programs.

It is noted that Route 560 is the most intact example of the island's old "belt road" system. Among the physical, historic, and character-defining qualities of Route 560 are the:

- o almost unchanged alignment of the road since its completion in the early 1900s,
- o original or historic width and frequent absence of shoulders, as were the conditions in the late 1920s,
- o presence of numerous one-lane bridges representing the construction methodology and material type of their original period of construction, and
- o guardrails and barrier walls that were constructed of timber-beam/concrete-post or masonry rock construction.

The specific character-defining qualities of the one-lane bridges are:

- o single-lane operations,
- o narrow width with no sidewalks,
- o solid reinforced-concrete parapets, and
- o flat slab, concrete box, or girder structural systems.

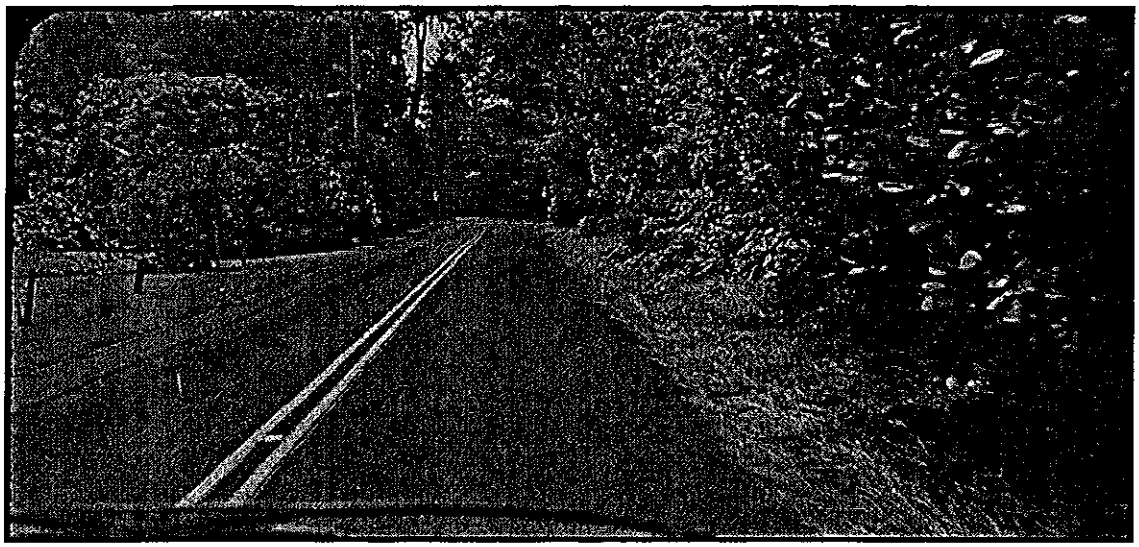


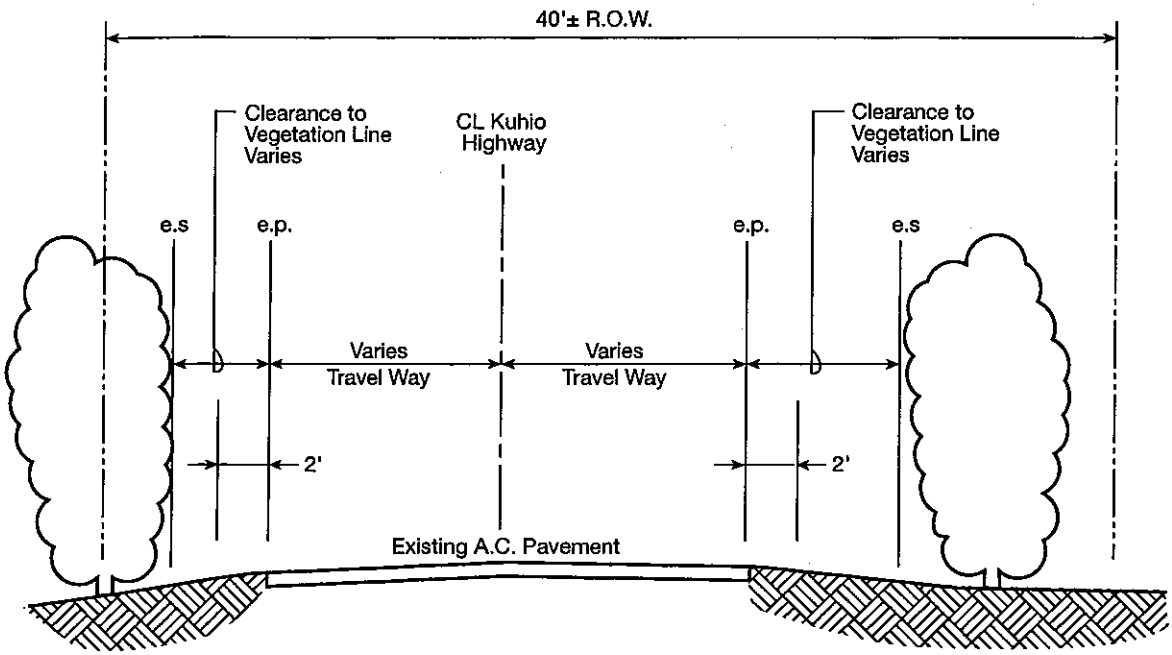
LEGEND

e.p.	Existing edge of pavement and travel way
e.s.	Existing edge of shoulder
R.O.W.	Right-of-way
CL	Roadway Center Line
A.C.	Asphalt concrete

Figure 2
EXISTING CONDITION 1
TYPICAL COASTAL HILL SLOPE AREAS

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii



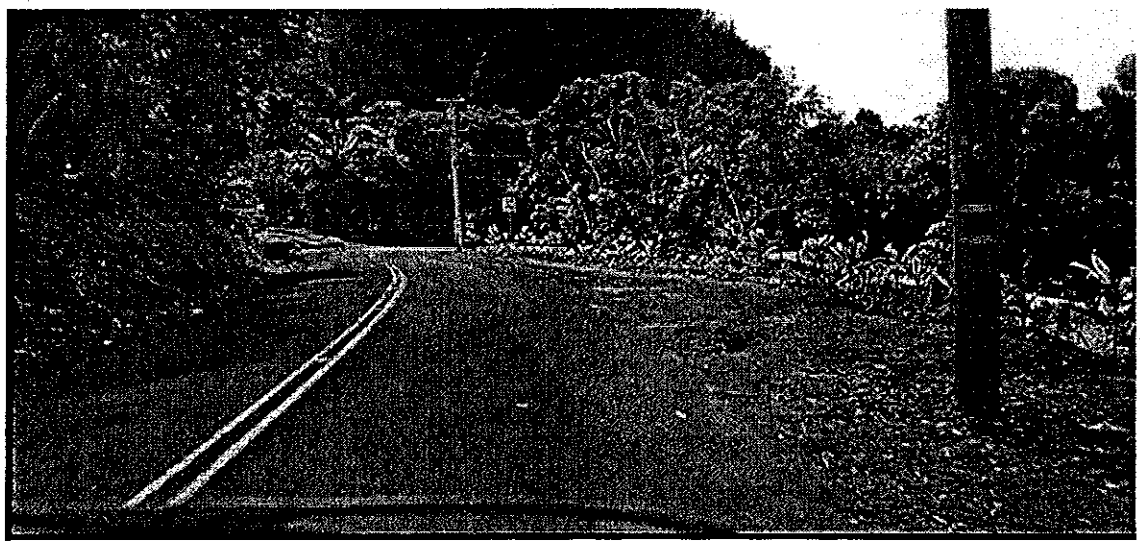


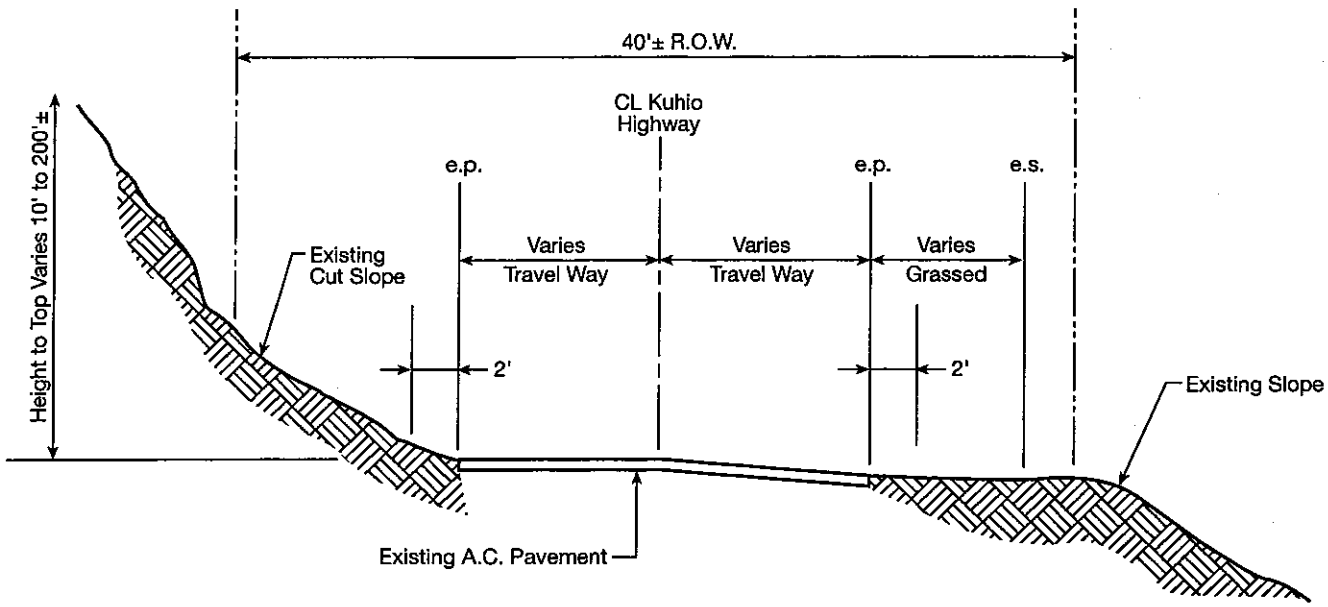
LEGEND

e.p.	Existing edge of pavement and travel way
e.s.	Existing edge of shoulder
R.O.W.	Right-of-way
CL	Roadway Center Line
A.C.	Asphalt concrete

Figure 3
EXISTING CONDITION 2
TYPICAL COASTAL AND ALLUVIAL PLAIN AREAS

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii





LEGEND

e.p.	Existing edge of pavement and travel way
e.s.	Existing edge of shoulder
R.O.W.	Right-of-way
CL	Roadway Center Line
A.C.	Asphalt concrete

Figure 4
EXISTING CONDITION 3
TYPICAL HILL SLOPE AND PLAIN MIXED AREAS

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii

Other one-lane bridges along Route 560 include a steel-frame bridge, wood-frame bridges, a concrete ford crossing, and a concrete slab with no parapets. A glossary of the roadway, bridges, and associated elements are provided in Appendix B.

VII. GENERAL POLICIES FOR ROUTE 560 AS A RURAL-HISTORIC ROAD

1. Route 560 is recognized as a historic resource and an asset to the community that should be maintained and preserved, as required.

2. The HDOT shall exercise CSD, as an overarching strategy, in the planning process for Kuhio Highway (Route 560). Through the CSD process, HDOT shall recognize and harmonize any preservation, rehabilitation, restoration, reconstruction, maintenance, repair, or improvement works with the natural features, scenic amenities, and historic elements of the highway corridor.

3. Maintenance, repair, and improvements to Kuhio Highway (Route 560) should be subject to the review of the State Department of Land and Natural Resources (DLNR), and consistent with the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties (see Appendix C). The four treatment approaches of the SOI's Standards are (in hierarchical order from high to low) preservation, rehabilitation, restoration, and reconstruction of historic and cultural resources.

4. Decisions concerning the preservation, rehabilitation, restoration or reconstruction of any bridge, stream crossing, structure, or other corridor elements should reflect the facility's historic characteristics and cultural landscape, as specified in the SOI's Standards. Such decisions should take into account safety and maintenance operations as well as aesthetic values.

5. The decision process on any selected design not conforming to existing standards should include a thorough documentation of a diligent evaluation of the design's alternatives and any known associated safety deficiency corrections.

6. Safety considerations shall be incorporated in any maintenance, repair, preservation, rehabilitation, restoration, and improvements on Route 560. Traffic calming devices shall be used on the low-speed road, where applicable, and designed in a manner compatible with the historic character of the corridor.

7. Maintenance operations shall play a major role in the implementation of the plan. Whenever feasible, maintenance or repair work on any roadway element should reflect its original design, material, and color, and follow the Standards of the SOI. Any maintenance work requiring departure from the recommendations of the plan and deemed necessary by HDOT should include input from the community.

8. Highway maintenance, repair, preservation, rehabilitation, restoration, and improvements should recognize the immediate, as well as future needs, of the highway corridor over the next 25 years.

9. Route 560 between Hanalei and Haena shall be designated a "shared use" facility for vehicles and bicycles, as provided in the Bike Plan Hawaii (BPH). In accordance with the definition provided in the BPH, a shared roadway refers to any street or highway that is open to both bicycles and motor vehicle travel.

10. Identified view planes to the ocean, mountains, coastline, and Hanalei Bay and River shall be preserved and maintained.

11. Emergency plans for collapsed bridges, major flooding, and mud/rock slides, which affect the highway corridor, should be prepared.

12. Community support and participation are encouraged in the implementation of this plan.

VIII. DESIGN GUIDELINES

A. Roadway and Shoulders

Hanalei Town [Hanalei Trader to Waioli Bridge (see Figure 5)]

1. The existing right-of-way width, historic road pavement width, and road alignment should be retained. If modifications are required to address safety concerns, HDOT should consult with the provisions of this plan and the community, if necessary, prior to proceeding with the changes.

2. Route 560 through Hanalei town [Hanalei Trader to Waioli Bridge] should be pedestrian-friendly. Through its town center [Hanalei Trader to U.S. Post Office (see Figure 5)], improvements should be pedestrian-oriented.

3. A safe pedestrian environment should be provided along Route 560 in the town center where commercial and public facilities occur. Such environment should include the separation of pedestrian facilities from vehicular facilities where possible. The design of these facilities should reflect the small town/rural character of Hanalei.

4. Road shoulders outside the town center should consist of a grassed area that is graded even with the road.

5. Traffic signals are not encouraged in Hanalei town.

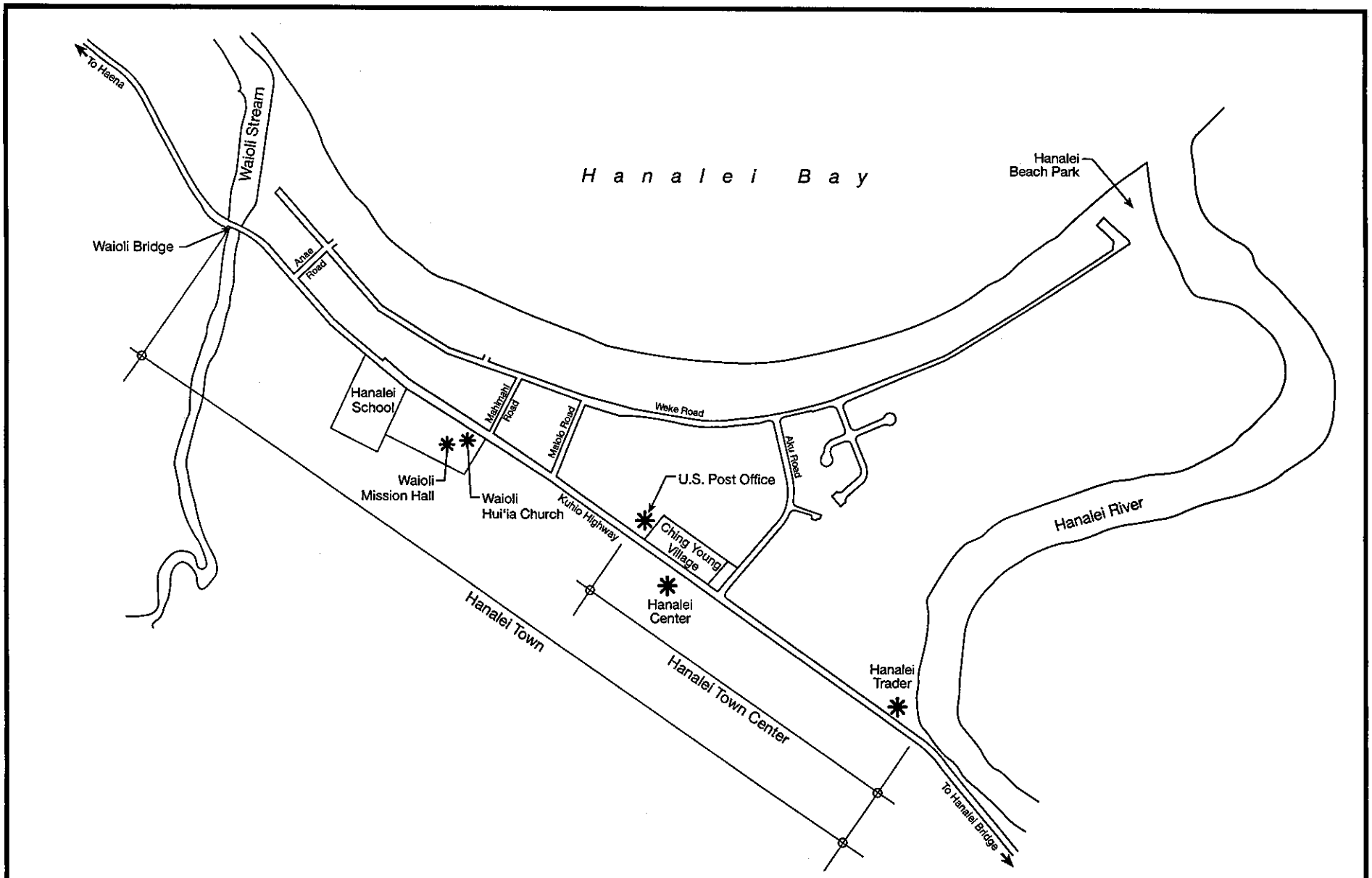


Figure 5
HANALEI TOWN

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii

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6. Traffic calming devices or speed controls (including signage) should be installed to control speeding through the town area and designed in a manner compatible with the historic character of the road.

Rural Area

1. The existing right-of-way width, historic road pavement width, and road alignment shall be retained. If modifications are required to address safety concerns, HDOT should consult with the provisions of this plan and the community, if necessary, prior to proceeding with the changes.

2. In order to attain a consistent travelway, Route 560 should maintain, where feasible, a two-lane width of 18 feet (see Figure 6).

3. Traffic signals, curbs, gutters, and sidewalks should not occur in the rural areas.

4. Road shoulders should be grassed (unpaved), graded even with the road, and be a minimum width of 2 feet, where feasible.

5. For vehicle safety purposes, a minimum clear zone width of 10 feet beyond the paved road edge should be provided, where feasible. Within this zone and adjacent to the road, pedestrian safety shall also be a consideration.

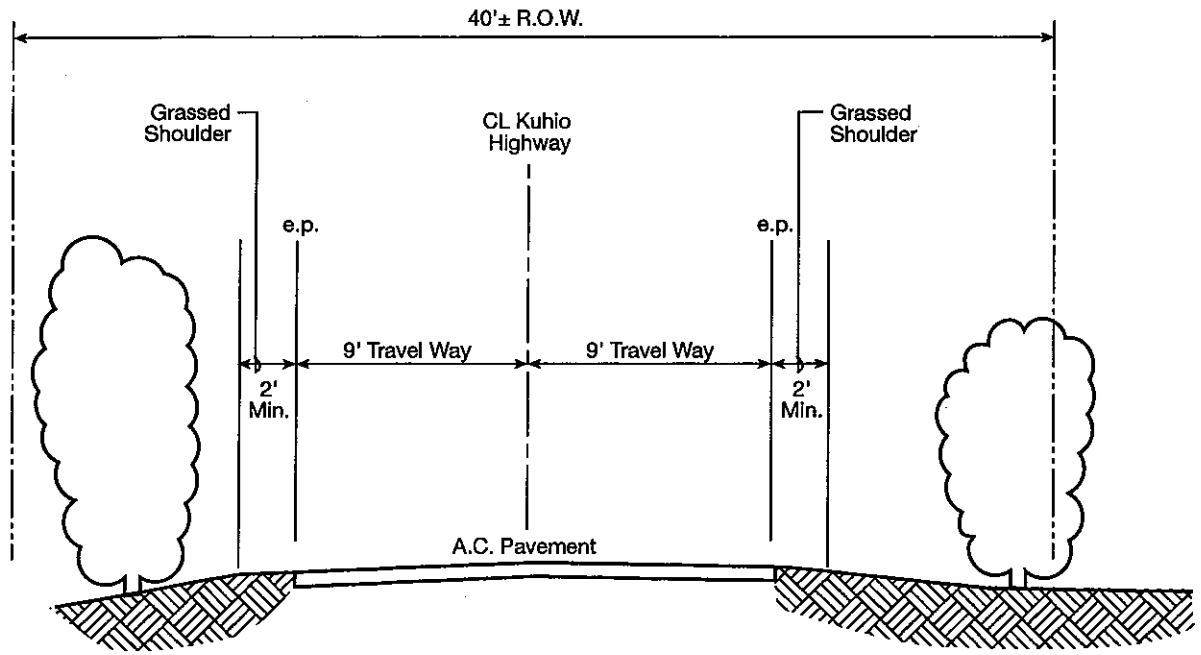
6. For road segments where shoulder areas, clear zones, and sight-distances are constrained or limited, and where there might be significant pedestrian crossing or adjacent traffic, lower speed limits should be considered, if necessary.

7. Traffic calming devices, including signage, should be considered to reduce speed in areas where speeding occurs.

8. Roadside vegetation shall be maintained to provide a traversable path on at least one side of the road for pedestrian access.

9. New plantings in the shoulder area should be for re-vegetative purposes or to enhance unattractive roadside conditions.

10. Overgrown vegetation in shoulder areas should be regularly removed to provide necessary sight line distances particularly at curves and bridge approaches. Overgrown vegetation, which obstruct view planes, should be removed to preserve visual contact with existing scenic amenities. Spraying of herbicides should be minimized, where feasible.



LEGEND

e.p.	Existing edge of pavement and travel way
R.O.W.	Right-of-way
CL	Roadway Center Line
A.C.	Asphalt concrete

Figure 6
RECOMMENDED TYPICAL ROAD SECTION FOR ROUTE 560

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii

B. Bridges

1. Any preservation, rehabilitation, restoration, or reconstruction work on the bridges should be consistent, as much as practical, with the original historic design, scale, and color of the structure, the National Historic Preservation Act (1966, as amended), and the SOI's Standards for the Treatment of Historic Properties.

2. Replacement of any of Route 560's one-lane bridges should:
   a) be reconstructed, as much as practical, with a bridge similar in design,
   b) have a single 12'-wide travel lane and 2'-wide shoulders (see Figure 7),
   c) have parapets or rails that are designed in character with Route 560's existing one-lane bridges,
   d) accommodate pedestrian/bicycle access within or outside of the bridge,
   e) have a posted load of 15 tons and be capable of accommodating 18-ton fire trucks and other public utility or service vehicles, and
   f) incorporate AASHTO guidance or crash-tested features.

3. The hydraulic capacity of the one-lane bridges' historic design will require special consideration and/or adjustments under current design standards.

4. Adequate sight distance shall be provided at all approaches to one-lane bridges. When such adequate sight distance is inconsistent with the historic or scenic element of the Plan, the speed limit on the approach should be reduced.

5. Concrete slabs, fords, and other similar crossings with no parapets or rails should incorporate safety features for pedestrian crossings, such as separate pedestrian crossings, warning signs, alternative routes, etc.

C. Pedestrian Walkway

Hanalei Town

1. At sites where commercial or public buildings can be set back from the highway, pedestrian walks/paved paths are encouraged to meander away from the street and curb to provide a wider separation for pedestrian walkways from the road travelway.

2. Within the residential section of Hanalei (outside of the town center), curbs and paved sidewalks shall not be required. Pedestrian walks/paths could be unpaved or delineated and should be separated, where possible, from the road with open space to establish a separation from the street pavement.

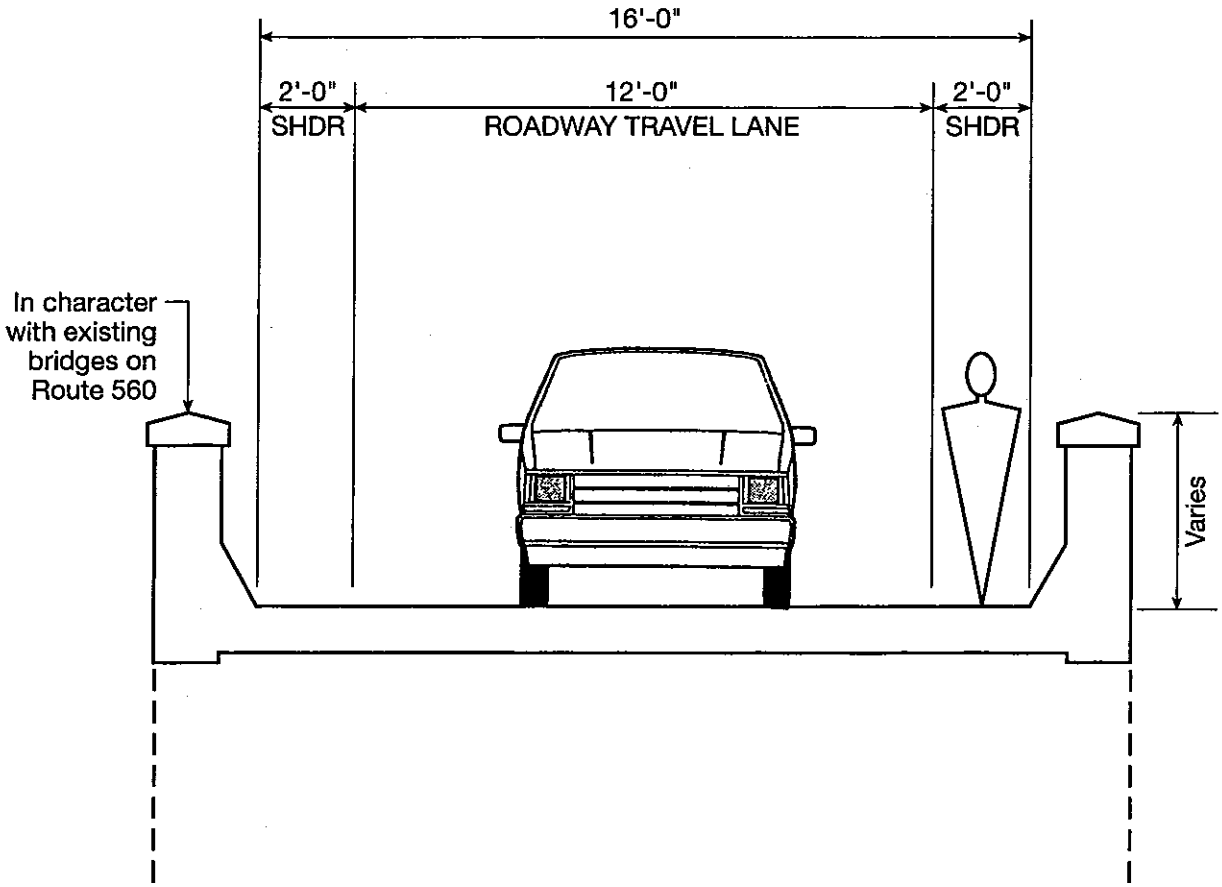


Figure 7
RECOMMENDED SECTION FOR POTENTIAL BRIDGE REPLACEMENTS

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii

Rural Area

1. Curbs and sidewalks, including paved pedestrian walks/paths, should not be installed in the rural areas. Unpaved road shoulders and adjacent areas within the right-of-way should be traversable for pedestrian use on at least one side of the road pavement.

2. Pedestrian paths should be constructed of material that is consistent with the rural character of the area or part of the maintained grassy and traversable area of the shoulder.

D. Bicycle Access

Hanalei Town

1. Route 560 within Hanalei town shall be a "shared use" road for vehicles and bicycles.

2. Bicycle paths should conform to the State's current Bike Plan Hawaii for the region.

Rural Area

1. Route 560 outside of Hanalei town shall be a "shared use" road for vehicles and bicycles and a designated bike route.

2. Bicycle paths should conform to the State's current Bike Plan Hawaii for the region.

E. Parking, Lookouts, and Pullovers

1. On-street parking in Hanalei town center should be prohibited and shoulder areas along that road segment should be opened to pedestrians.

2. On-street parking should be minimized in the remainder of Hanalei town and all other rural areas where parking hazards occur.

3. Scenic lookouts should be located at vantage points where adequate right-of-way width exists. Small lookout parking areas are preferred over large parking areas to maintain the rural appearance of Route 560.

4. For safety purposes, all lookouts and pullovers should be clearly striped to delineate the boundary between the road and lookout parking/pullover area.

5. Pullovers should be provided, where feasible, at regular intervals and at safe locations to accommodate emergency stops or provide pullouts so trailing vehicles can pass. All

pullovers should be signed one-quarter mile in advance. Pullovers need not be paved and may include stabilized, unpaved shoulders.

F. Corridor Elements and Utilities

1. Guardrails:

   a) Guardrails or protective barriers should have minimal visual impacts and an appropriate design that could include timber beam with steel backing, box beam, painted (as appropriate) steel rails and posts, concrete core with rock face, or similar rural design. The selected guardrail design shall be crash-tested approved.
   b) CSD guardrails shall be installed, where deemed appropriate and justified, based on scientific methodology addressing accident history, severe topographic conditions along shoulder areas, and fixed hazards. The installation plan for the guardrails should be available for public review and comment.
   c) Guardrails shall be located no less than 4 feet from the edge of the road travelway, where feasible.
   d) All terminal ends shall be in compliance with the range of allowable options provided within HDOT standards, and, whenever feasible, maintained in the color/finish of the primary barrier, or of a color/finish complimentary to the primary barrier, unless otherwise authorized. If a historically compatible design or other CSD option is not attainable within the range of allowable options, a design exception may be sought.
   e) Guardrails incorporated into the approach of bridges shall be pedestrian-friendly with the goal of providing safety for both vehicles and pedestrians, and being in compliance with the range of options provided within HDOT standards, unless otherwise authorized. Additionally, the design of the approach guardrail should be compatible with the character of the road and bridge and crash-tested to meet minimum safety requirements. Any repairs or preservation, restoration, rehabilitation or replacement work on the approach guardrail shall include an evaluation of its adequacy. If an acceptable design option is not available, a design exception may be sought.
   f) Existing rock walls should be retained and rehabilitated, wherever feasible.

2. In order to protect the region's rural setting, wildlife, and night sky's visual quality, the use and type of streetlights should be limited. Street lights should not be installed outside of Hanalei town except at road intersections, one-lane bridge approaches, and road segments with atypical alignments and sudden right-of-way constraints. The light fixtures should direct their illumination towards the road with minimum glare and utilize lamps providing full spectrum color.

3. Utility poles located immediately adjacent to the road pavement should be relocated to the highway right-of-way boundary, when feasible.

4. Drainage improvements should be implemented in areas where frequent heavy flooding occurs.

G. Signage

1. An educational, historical/cultural interpretive sign should be erected at the beginning of Route 560. In addition to providing a background and history of the region, the sign should inform the visitors of the uniqueness of the area and alert them to the region's narrow roads and one-lane bridges. Etiquette rules should be explained for driving along Route 560 and for crossing any of the one-lane bridges.

2. Directional, name place, and scenic/cultural identification signs should be of rural/historic character, unique to the Hanalei area, and consistent in design theme, size, and color.

3. Signs should be installed indicating that Route 560 is a "shared use" road and designated bike route.

4. Additional signs should be installed at specific locations to improve warnings of hazardous areas and atypical road conditions.

5. Excessive use of signs and sign clutter should be avoided.

H. Transportation and Others

1. Investigate alternative plans, such as a shuttle service, for transporting visitors to scenic locations, parks, and other destinations along Route 560. Private or community groups could initiate this effort and consult with area residents on such alternative transportation plans.

IX. IMPLEMENTATION

A. COURSES OF ACTION

Roadway and Shoulders:

Hanalei Town

1. The community should organize and participate in a program, such as a Main Street Program, that specifies improvements to Kuhio Highway (Route 560) through the town center. The plan would consist of safe, pedestrian-friendly facilities including pedestrian-oriented streets and walkways. Potential concepts for the right-of-way may include special surface or textured treatment of the road pavement and reduced

pavement widths to slow traffic and provide pedestrian-friendly crossings. Special landscape features in or around the road as well as creative pedestrian walkways are other design solutions that might emphasize pedestrian use of the area.

2. Install additional traffic control devices at the school zone for Hanalei School.

Rural Area

1. HDOT should prioritize improvements on Route 560 with input on preferences from the community.

2. Seek Section 106 of the National Historic Preservation Act (NHPS) of 1966 review and approval of the plan recommendations by the State DLNR.

3. When resurfacing occurs on any segment of Route 560, HDOT should maintain an 18' road pavement width to preserve the consistency of experience along the highway corridor.

4. When shoulder repair or grading work occurs over any segment of Route 560, HDOT should widen any substandard shoulders on that segment of the road to a minimum 2-foot width and maintain it as a graded, but unpaved, grassed area.

5. A transition zone for Route 560 between Mile Post 0 and Mile Post 0.4 (Hanalei Plantation Road) shall be established to allow highway facilities to transition from a standard-design highway to the desired-design provided in this plan.

6. HDOT should study and review qualifications and the need for traffic calming devices along Route 560 at the hairpin turn west of Princeville, along the Hanalei River between the Hanalei Bridge and Hanalei town, through Hanalei town, between Waioli Bridge and Waipa Bridge, at the straight-away stretch behind Lumahai Beach, and between Wainiha Bridge #1 and the Power House Road (see Figure 8). Traffic calming devices shall conform to the rural character of the area and be constructed of materials appropriate to the cultural landscape.

7. Repair and maintenance of the roadway corridor should be conducted in accordance with Subsection B "Repair and Maintenance" of this Implementation section.

8. Vegetation clearance shall be a high priority at Wainiha Bridges Nos. 2 and 3 in order that an adequate line of sight to approaching vehicles on the opposite side of the bridges is maintained.

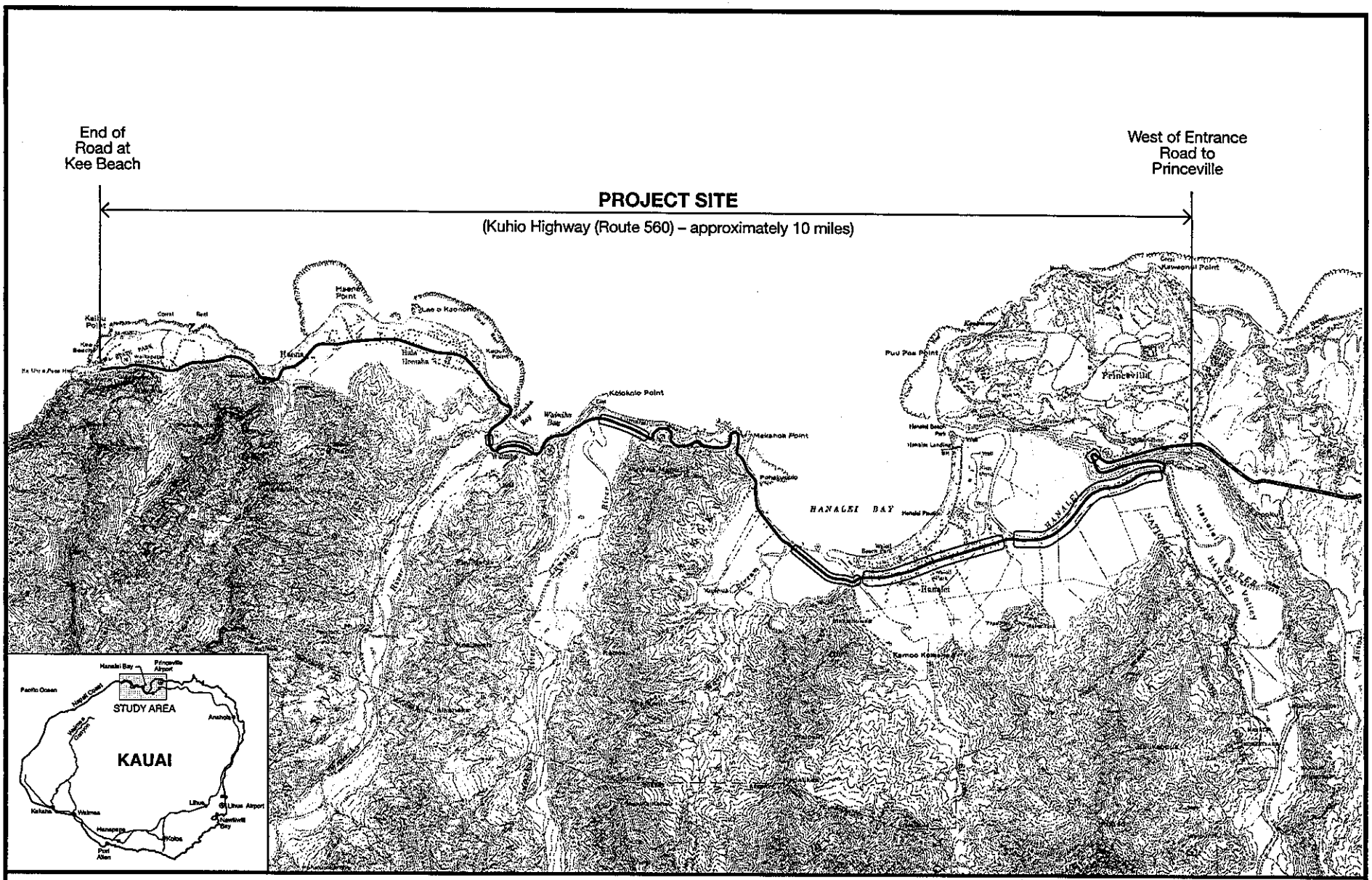


Figure 8
TRAFFIC CALMING DEVICES FOR SECTIONS OF ROUTE 560

Kuhio Highway (Route 560), Kauai, Hawaii
Prepared by: Belt Collins Hawaii

2000.70.0400/034-1 d8.30.05 3

Bridges:

1. HDOT should conduct a detailed, in depth bridge inspection of the one-lane bridges (except Hanalei Bridge[4]) along Route 560 that consists of detailed measurements, calculations and substructure analyses. The specific condition of each bridge should then be determined and a priority list of actions for all the bridges over the next 25 years should be prepared.

2. Based on general observations and assessments (see Appendix D), the following is a preliminary prioritization of the bridges along Route 560 that require some form of major work to maintain their original condition and/or address safety concerns. A final prioritization is anticipated after the in depth studies are conducted.

   <u>High Priority (0 – 8 years):</u>
   - o Wainiha Bridge 1
   - o Wainiha Bridge 2
   - o Wainiha Bridge 3

   <u>Medium Priority (9-16 years):</u>
   - o Haena 1 Bridge
   - o Waikoko Bridge
   - o Waioli Bridge

   <u>Low Priority (16+ years):</u>
   - o Haena 2 Bridge
   - o Hanalei Bridge
   - o Limahuli Crossing
   - o Lumahai Bridge
   - o Manoa Crossing
   - o Waipa Bridge

3. Biennial bridge inspections shall continue to be regularly conducted, and bridge repair and maintenance should be a high priority for HDOT to assure the preservation of the structures' historic value.

4. Demolition of any bridge shall require mitigation measures that include proper documentation and large-format archival photographs, as specified by the State Historic Preservation Division.

5. When a replacement bridge is constructed, a detour route shall be provided if available. Otherwise, the contractor shall construct a temporary crossing along side the original

[4] Hanalei Bridge was rehabilitated in 2004 and will not require any immediate in depth bridge inspection.

bridge, or construct the replacement bridge one half section at a time. Care shall be taken to avoid damage to any adjacent historic or cultural features.

Pedestrian Walkway:

1. Should the community pursue an improvement program, such as a Main Street Program, for Hanalei town center, HDOT should contribute to the design and have the final approval of the State right-of-way section through the town center.

2. In the town center, temporary commercial signs are placed along sections of the road shoulder. Such signs block pedestrian passage and should be removed from the public right-of-way.

3. The developer shall be responsible for funding/constructing associated pedestrian walkways or accesses for private development adjacent to Route 560 in Hanalei town center in conformance with this plan.

4. Road shoulders shall be kept cleared and unobstructed for possible pedestrian use via a traversable walkway in the rural areas.

Bicycle Access:

1. Provide information, where feasible, on Route 560's entrance sign and specific street signs to inform motorists and bicyclists that Route 560 is a "shared use" facility.

2. Road shoulders shall be kept cleared and unobstructed as a possible emergency pullover area for bicyclists.

3. Bicycle paths that extend beyond the "shared use" facility of Route 560 shall follow the proposed bicycle paths designated in the current Bike Plan Hawaii.

Parking, Lookouts, and Pullovers:

1. To reduce the need for on-street parking on Route 560 in Hanalei town center, adjacent business owners should develop adequate off-street parking on their properties. In the rural areas, appropriate government agencies should investigate the possibility of providing off-street public parking at popular scenic lookouts, public beach accesses, and State/County beach parks.

2. Existing major lookouts along Route 560 include: Hanalei Valley Scenic Lookout (Route 560, Mile Post 0.1), Hanalei Bay Scenic Lookout (M.P. 0.6), Makahoa Point Lookout (M.P. 4.7), Lumahai Beach (East) Lookout (M.P. 5.3), and Lumahai Beach (West) Lookout (M.P. 5.4). Each of these lookouts has parking for at least 5 vehicles. The parking area should be clearly marked from the highway travelway, stalls

delineated as necessary, and signage should be displayed identifying the facility. Some vegetation clearance will be required at the Hanalei Bay Scenic Lookout and Makahoa Point Lookout to open view planes across Hanalei Bay.

3. Place Route 560's entrance/orientation signage at the beginning of Route 560.

4. Minor lookouts and pullovers exist between Makahoa Point and Wainiha Bay. There are two pullovers at Makahoa Point, a pullover area at M.P. 5.0, a minor lookout at M.P. 5.1 behind Lumahai Beach, and a minor lookout at Wainiha Bay Point (M.P. 7.0). Each of these lookouts and pullovers has parking for 2 to 4 vehicles. Additional lookouts and pullovers are not necessary between Makahoa Point and Wainiha Bay.

5. A new lookout could be developed at M.P. 9.0 with a small parking area. Vegetation clearance would be required to open up view planes to Haena Beach and Haena Point.

6. The segment of Route 560 between the Haena Beach Park and open field parking in the Haena State Park has little or no shoulder area for emergency pullovers. Two or three safe pullover areas should be provided along this segment of the highway.

Corridor Elements and Utilities:

1. Installation of new guardrails shall be in accordance with the design guidelines of this plan.

2. All guardrails shall be structurally adequate to meet current crash-tested requirements for the road's design speed.

3. HDOT should coordinate with the utility companies to install utility poles and lines that meet minimum vertical and horizontal clearance requirements.

4. When public demand for drainage solutions occurs, a regional drainage study should be coordinated by the Hanalei Watershed Hui and conducted by the U.S. Army Corps of Engineers to determine appropriate actions for reducing major flooding problems in Hanalei Valley in relation to Kuhio Highway.[5]

[5] The Hanalei Watershed Hui has been involved or is cognizant of a number of flood and water quality studies in the Hanalei Valley area.

Signage:

1. Organize an ad hoc committee to develop an entrance sign and overall heritage or historic signage program for Route 560. The entrance sign should be unique to Hanalei, installed at the beginning of Route 560, and include the following basic information:

   a) Welcome statement.
   b) Notice of road being on the NRHP and SRHP.
   c) Description of road; its narrowness and sharp winding curves, and presence of one-lane bridges. This is to create a sense of expectancy for the motorists so the level of driving safety and awareness is heightened along the road.
   d) Notice of "shared use" of road for vehicles and bicycles, and it being a designated bike route.

2. In addition to identifying historic, cultural and scenic resources in the region, the heritage or special interest signs should point out notable geological landmarks and important botanical and wildlife habitats. The committee should work with the HDOT to obtain approval and initiate funding, design, and installation of the signs.

3. Bridge signs could also be included in the ad hoc committee's inventory of heritage or special interest signs. These signs should be coordinated with the HDOT to insure all safety precautions are included in the sign message. Information on the bridge signs may include the following:

   a) Name of bridge
   b) Notice of bridge's listing on the NRHP and SRHP
   c) Year of construction
   d) Rules of etiquette for proceeding across the bridge

4. Establish policies and/or regulations on roadside parking at hazardous locations. Install warning signs, such as "No Parking" and, where necessary, "Tow Away Zone" signs, etc. to implement parking restrictions and coordinate with County officials for enforcement actions.

Transportation and Others:

1. Seek input and participation from the visitor industry in cooperation with community groups on ways to provide alternatives to meet visitor transportation needs along Route 560.

B. REPAIR AND MAINTENANCE

1. HDOT should identify areas of potential repair and maintenance concerns, including those listed below, and establish a list of priorities with input on preferences from the community.

   - o pothole repairs
   - o road resurfacing
   - o road re-striping and replacement of damaged reflectors
   - o road edge deterioration repair
   - o erosion control and rehabilitation work
   - o bridge repair and maintenance
   - o guardrail repair and maintenance
   - o landscape maintenance in shoulder areas

2. A maintenance plan shall be prepared to address repair and maintenance needs on Route 560. The plan should include the following components:
   a) Landscape Maintenance: This component shall include provisions for mowing, trimming, and pruning vegetation in the shoulder area to maintain sight distances, traversable areas for pedestrian and bicyclist use, and view corridors. It should also include a schedule for regular maintenance and special projects, and a requirement that minimizes the use of herbicides. An essential objective of routine or regular maintenance is that it be undertaken in a diligent manner to maintain public safety within the roadway corridor.
   b) Repair/Replacement: Repair or replacement of any feature within the highway corridor should use design, material, and finishes associated with the historic road.
   c) Finish Treatment: Care and scheduling notes for all paints and finishes should be established, approved cleaning treatments and applications should be outlined, and procedures for "patching" pavements or structures should be set forth.
   d) Inventory Stockpiling: As with any historic structure, replacement of parts will take time for researching, locating, or manufacturing for that particular part, and delivering. Such a long lead time for that process would be critical when parts are needed in the event of an emergency repair. HDOT should make provisions to stockpile historic parts for the highway that have high replacement needs.
   e) Education: As caretaker of the highway corridor, the maintenance crew should be considered guardians or stewards of the public right-of-way. The maintenance plan should have provisions to educate the crew on its responsibilities and importance of adequate and proper roadway maintenance. Being that there are currently no reward programs for HDOT employees who display extra effort in their work and no funds available for initiating such a program, it may be recommended that a community group be recruited to organize and support such a program. The same organization could assist HDOT with the agency's Adopt-a-Highway program for the North Shore.

3. Should funding become available, HDOT should establish a repair and maintenance hot line to provide public information on HDOT maintenance work and schedule. Since HDOT is responsible for all State highways, the hot line service would be available to all callers on the island. The HDOT phone operator should be cognizant of HDOT's priorities on special maintenance projects as well as up-to-date on community concerns on State roads. The operator should be authorized and obligated to communicate community concerns back to the HDOT District Engineer.

C. EMERGENCY PROGRAMS

1. HDOT should prepare an emergency plan for major flooding and rock/land slides that affect Route 560. Such a plan should include an early warning system with updated public announcements. Information should be provided on which roads and bridges would be closing or opening and when, and a contact number for those who would be or are affected and in need of assistance.

2. HDOT should also prepare a long-term improvement plan to protect Route 560 from potential rock/land slides and coastal erosion. Although a number of solutions are available, such as slope stabilization measures as well as roadway foundation and structural improvements, the long-term improvements to the road should include, as a minimum, design elements that are in harmony with the historic character-defining qualities of the right-of-way corridor and safety features for motorists, bicyclists, and pedestrians. To assure their success, the proposed improvements should include also a monitoring and maintenance program. Preparation of the improvement plan should be a high priority.

3. An emergency plan for collapsed or failing one-lane bridges should be prepared and include:

   a) types of temporary bridges that can be installed while the permanent bridge is being designed and constructed;
   b) guidelines on location, construction methodology, and scheduling for the temporary bridge;
   c) instructions on advance ordering and stockpiling of parts for the temporary bridge;
   d) terms on when and how the temporary bridge is to be removed after the permanent bridge is constructed; and
   e) contact list for public information of participating government agencies and their responsibilities.

4. The HDOT should work with the County Public Works Department, medical institutions, and utility companies to develop a plan for emergency (including fire and medical) and utility vehicles to safely cross the one-lane bridges of limited capacity. The construction and service industries also should be consulted and informed of any

new bridge crossing procedures. As possible options, bridge users should consider modifications to their vehicles and/or equipment to meet bridge load and width dimension limitations as well as other solutions as alternatives to bridge crossing.

D. ENFORCEMENT

1. HDOT should reassess the traffic condition on Route 560 and determine where hazardous condition signage, lower speed limits, and traffic calming devices would be effective applications to reduce potential traffic hazards and improve public safety.

2. HDOT should prioritize enforcements actions on such identified activities as listed below and coordinate the actions with appropriate enforcement agencies.
   - o no parking provisions in hazardous traffic areas
   - o speed limit provisions
   - o bridge crossing etiquette
   - o bridge load limit crossing by heavy vehicles

E. FUNDING AND PROGRAM SUPPORT

1. To implement the objectives and policies of Route 560's historic roadway corridor plan, HDOT should use the flexible design provisions in the most current version of AASHTO's "Green Book" and "A Guide for Achieving Flexibility in Highway Design." The Hawaii Administrative Rules for HDOT, henceforth, should be updated/amended to reflect the use of those guidelines.

2. In addition to the flexible design provisions of the AASHTO guidelines, HDOT should apply design exceptions, where necessary, and participate in and benefit from the NSBP should that program become established in Hawaii. HDOT should also use applicable alternative design standards, as needed, in compliance with Section 106 of the NHPA of 1966.

3. Revenues or funds are available from State sources each year to HDOT, Highways Division, Kauai District. The amount of funds available to the Kauai District office will determine the extent of improvements and repair/maintenance work that can be done on Kuhio Highway (Route 560). Additional sources of funding, potentially from the US Department of Transportation and NSBP, are available and should be pursued to help supplement the funding of HDOT's various projects.

4. Encourage the organization of a community group, association, or conservancy to support the HDOT's implementation program. Such a group or groups would focus on the historic and cultural amenities of the road and provide for the public educational materials on those valuable resources as well as on driving safety and bridge etiquette. It would also coordinate community efforts to maintain the landscaped areas,

participate in the Adopt-a-Highway program, promote the scenic beauty of the roadway corridor, and help with the possible establishment of a Main Street Program or similar type program for the Hanalei town center. Additionally, an ad hoc committee could be created to work with the HDOT to design, fund, and install a Hanalei entrance sign and Route 560 heritage signs.

5. The community has and will continue to contribute to the planning and design process for Kuhio Highway (Route 560), including providing input on the prioritization of improvements. HDOT should continue to be the final decision-maker and responsible party on all aspects of funding, design, construction, and maintenance of Kuhio Highway (Route 560), unless otherwise provided.

X. LEGAL FRAMEWORK AND STRATEGY FOR IMPLEMENTATION

1. Listing of Route 560 on the NRHP and SRHP subjects any improvements within the highway corridor receiving federal aid to SHPD review under Section 106 of the NHPA. Route 560's placement on the two registers should be used to support the implementation of the plan's design policies. It should also justify Route 560 for various preservation, rehabilitation, restoration, and reconstruction treatments and the need for flexible design considerations.

2. HDOT should use the flexible design provisions of the AASHTO's "Green Book" and "A Guide for Achieving Flexibility in Highway Design" to attain the design objectives and policies established in the historic roadway corridor plan.

3. For the recommended roadway and bridge features that fall outside the allowable range of AASHTO's design values, design exceptions may be sought. The design exception process, which is intended for individual highway components, is highly procedural and extensive and hence, an early, careful planning effort should be undertaken from the start.

4. Planning and implementing the design policies of Route 560 and its bridges should be thoroughly and meticulously documented (ref: Appendix E - Memorandum):

   a) to include the fixing of past safety problems of areas that are subject to the provisions of the historic roadway corridor plan;
   b) in order that the final design is the result of a broad policy and discretionary decision rather than an individual ministerial or operational action or requirement;
   c) as a context sensitive design process that considers: safety, aesthetics, community traditions, environmental impacts, financial resources, contemporary design, time constraints, previous studies, institutional experiences, and cost-benefit analyses;
   d) to demonstrate that the overall design choice reflects sound and acceptable engineering practices;

e) to demonstrate that the plan is designed to maintain a consistent experience along the entire highway corridor without sudden surprises or disruption to the driver's expectations;
f) to identify the circumstances, considerations, and choices of the project, i.e., the available choices and the importance and weight of the different factors affecting the project; and
g) to provide clear explanation and reasoning behind the final choice.

5. Kuhio Highway (Route 560) is not on the National Highway System. Hence, no Federal Highway Administration (FHWA) approval is required for design exceptions. If, however, federal aid is used for the project, federal review will be required.

6. The HDOT should work with the State Attorney General's office to establish some form of sovereign immunity for its function as a manager of Route 560 and although securing approval for such legislation would be difficult, it should be maintained as a future objective for the agency.

NOTE: AFTER THE COMPLETION OF THIS PLAN BY THE HDOT IN EARLY 2005, ACT 185 (SB1876, SD2, HD2, CD1 - 2005 LEGISLATIVE SESSION) WAS SIGNED INTO LAW ON JULY 31, 2005 DIRECTING THE HDOT TO ESTABLISH NEW GUIDELINES THAT TAKE INTO ACCOUNT CSD AND FLEXIBILITY IN HIGHWAY DESIGN FOR ROADS AND BRIDGES, ESPECIALLY IN RURAL AREAS, THAT CALL FOR THE RETENTION OF THEIR UNIQUE QUALITIES AND CHARACTERISTICS (SEE APPENDIX F). ADDITIONALLY, THIS LAW LIMITS LIABILITY OF THE STATE AND COUNTIES IN THEIR APPLICATION OF FLEXIBLE HIGHWAY DESIGN STANDARDS.

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APPENDICES

APPENDIX A

COMMUNITY ADVISORY COMMITTEE

Members		Organization or Affiliation
1.	Steven Kyono	Hawaii State DOT - Kauai District
2.	Ladye Martin	Kauai County Public Works Department
3.	Representative Hermina Morita	Hawaii State House of Representatives
4.	Barbara Baker	Former Principal, Hanalei Elementary School
5.	Mary Cooke	National Trust for Historic Preservation
6.	Mamo Cummings	Kauai Chamber of Commerce
7.	Rodney Haraguchi	Hanalei Taro Growers Association
8.	Michael Loo	North Shore Business Council
9.	Ed Matsukawa	Kauai Island Tours
10.	Barbara Robeson	Hanalei Roads Committee
11.	David Sproat	Hawaiian Farmers of Hanalei
12.	Glen Takenouchi	The Gas Company
13.	Carol Wilcox	Hanalei Roads Committee
14.	Chipper Wichman	Limahuli Gardens
15.	Naomi Yokotake	Hanalei Community Family Center

Substitutes		
1.	Pam Dohrman	Hanalei resident
2.	Brian Hennessy	Engineering consultant
3.	Rohit Mehta	Princeville resident
4.	Robin Simpson	DOE representative

Special Advisors		
1.	Dan Marriott	Historic Roads Consultant (Paul Daniel Marriott & Associates)
2.	Abba Lichtenstein, P.E.	Structural Engineer (Historic Bridges Specialist)
3.	Barbara Shideler	Historian (Mason Architects Inc.)
4.	Bill Tam, Esq.	Attorney (Former State Deputy Attorney General)

APPENDIX B

GLOSSARY OF ROADWAY, BRIDGE, AND ASSOCIATED ELEMENTS

GENERAL SUBJECTS

The Road
The Bridge
The Right-of-Way
Construction Material
Guardrail Types
Preservation Treatments
Safety Measures
Planning
Hanalei Community

GLOSSARY

The Road

Alignment

Alignment refers to the horizontal or vertical movement of the road. More specifically, horizontal alignment refers to a road's movement to the left or right—its curves. Vertical alignment refers to a road's movement up and down—its hills. Horizontal and vertical alignments may overlap.

Crown

The crown of a road is the rise or upward arc toward the center of the travelway that provides for drainage. Water is directed away to a gutter, shoulder, or swale.

Curb

A curb is a raised face at the edge of the travelway or gutter. Generally, 6 to 12 inches in height, a curb provides a physical barrier between the travelway and the adjacent sidewalk or landscape.

Gutter

A gutter is a channel at the edge of the travelway designed to collect and direct surface runoff away from the road. Gutters are generally concrete or brick.

Pavement

Pavement is the durable or semi-durable surface of the travelway. Pavement may be dirt, gravel, wood (logs lain side-by-side to create a "corduroy" road or wood blocks), stone (cobblestone or granite Belgian-block), brick, macadam, concrete, or asphalt.

Pull Over

A pull over or turn out is a widened, unobstructed paved shoulder area that allows slow-moving vehicles to pull out of the travelway to give passing opportunities to following vehicles.

Shoulder

A shoulder is a stabilized surface that runs parallel to and is flush with the travelway. In general, a shoulder is used for higher-speed roads that have no curb and gutter. It varies in width and may or may not be constructed of the same material as the travelway. Shoulders are generally viewed as a safety feature, allowing for disabled vehicles to move out of the traffic in the travelway.

Structure

Integral structures may be associated with the road and are essential to its design and function. These may include bridges, culverts, tunnels, toll booths, and retaining walls.

Subsurface

Subsurface refers to the stabilized base beneath the pavement. The subsurface provides both a stable base to support the pavement and a prepared surface on which to lay or adhere the pavement. The subsurface comes in contact with the ground.

Travelway

The travelway refers to the area of the road dedicated to the movement of vehicles. This may also be referred to as a "carriage way" or "travel lane."

The Bridge

Abutment

Structures within the stream bed supporting the span of a bridge at the stream embankments.

Design Load

The force for which a structure is designed; the worst possible combination of loads.

Girder

A main beam upon which floor joists rest, usually made of steel or wood. Concrete may be used for larger structures.

Hydraulic Capacity

The capacity of the area beneath the bridge that allows storm flows to safely pass to prevent upstream flooding and flows from overtopping the bridge deck.

Load Rating

A bridge load rating is used to determine the usable live load capacity, based on the judgment of the engineer using either load factor analysis or allowable stress analysis.

Parapet

A low wall design used for bridge railings.

Pier

A structure within the stream bed supporting the span of a bridge between the abutments.

Span

The section of the bridge between the abutments and/or supporting piers. Single-span bridges have no supporting piers.

Superstructure

The part of the bridge resting on its abutments and piers, including the deck and railings.

Truss

A rigid framework, consisting of wooden beams or metal bars, designed to support a structure.

Understructure

The structural system supporting the bridge deck. Includes the abutments, piers, arches, etc.

The Right-of-Way

The right-of-way is composed of the elements and structures that are immediately adjacent to the road and which enhance its function, use or safety. The right-of-way includes publicly held lands or easements associated with the roadway for other public services (utility poles, for example). Elements associated with the right-of-way include:

Barrier

A barrier is a safety feature designed to protect the vehicle from a hazardous situation. Barriers are commonly constructed as guardrails, walls, or posts.

Clear Zone

A clear zone is the unobstructed, relatively flat area provided beyond the edge of the travelway for the recovery of errant vehicles. The width of the clear zone is influenced by several factors, the most important of which are traffic volume, design speed of the highway, and slope of the embankments.

Guardrail

This is a barrier, usually of post-and-beam construction, located alongside a roadway, in medians, and in front of hazards to prevent an errant vehicle from striking an obstacle or encountering a dangerous slope.

Jersey Barrier

An angled concrete barrier designed to guide an errant vehicle back onto the roadway.

Lighting

Lighting refers to both the source of light and its intensity, and the design of the fixture that supports the light source.

Path

Paths provide access for pedestrians and bicycles and are generally less formally defined than sidewalks. Paths may originate from an unplanned or organic use (people tend to create paths if no other accommodation is provided), or may have been designed. Paths may be unpaved or have a gravel or asphalt surface.

Shared Use

A shared use roadway refers to any street or highway that is open to both bicycle and motor vehicle travel, but has no special signage for bicyclists. A shared use roadway typically features a lane width that is 12 feet or less, with no shoulders.

Sidewalk

Sidewalks are durable paved surfaces that run generally parallel to the road and are dedicated to the use of pedestrian (and sometimes bicycle) traffic. They may be constructed of stone, wood, brick concrete, or pavers.

Signs

Road-related signs provide information for the traveler about road identification (route number), location, direction, distance, warnings, and regulations. Signs may also provide visitor information, serve as commemorative or gateway features, or provide visitor orientation.

Swale

A swale is a slight depression or ditch parallel to the road that serves as a collector for rainwater runoff.

Traffic Control Device

Traffic control devices may include traffic signals, flashing lights, signalization boxes, electronic lane markings, and electronic message signs.

Utilities

Utilities may be above or below ground and include electric, cable, telephone and fiber optic lines; gas, water, irrigation, storm, and sewer pipes; and transformers, service boxes, and steam tunnels.

Wayside and Overlook

Waysides and overlooks are pull-offs adjacent to the road designed to provide access to scenic views, interpretation or historical markers, or picnic tables. Such features are generally without restroom facilities.

Construction Material

Reinforced Concrete

Concrete reinforced by the addition of steel bars making it more able to tolerate tension and stress.

Pre-cast Concrete

Concrete forms cast into permanent shapes using reusable forms at a plant, then transported as fully cured structural units to the actual construction job site.

Pre-stressed Concrete

Concrete that has already been subjected to compression increasing its ability to withstand tension and stress without the need for steel reinforcement.

Guardrail Types

Concrete Core Stone Masonry

This type of guardwall has a reinforced concrete core with a stone facing capable of providing modern safety.

Painted Steel Beam

Steel beams may be painted to harmonize the color of the barrier with the surrounding environment. Painting the surface of the rails, however, is not an efficient solution, as paint will not endure for the useful life of the system and will require continual maintenance.

Steel Box Beam

This system consists of a 6" by 6" square steel tube mounted on steel posts that are set at 6' centers. Box beam rails have less visible area than W-Beam and Thrie-Beam rails. They also come in a harmonizing russet brown surface to blend with the natural colors of the area.

Stone Masonry

This type of guardwall resembles the native stone walls that were used on the rural and scenic roads of the early 1900s. They were usually mortared or dry laid.

Thrie-Beam

The Thrie-Beam system is similar to the W-Beam system, but uses a wider (19-7/8") corrugated rail. Its profile shows three "bumps." This guardrail type is most often used in narrow medians and in certain highway applications where superior strength is required but where there is not adequate space to accommodate a rigid barrier such as a jersey barrier.

Timber Beam with Steel Backing

This system uses wood rails with steel plate backing to provide additional tensile strength to the structure. The posts are metal or wood.

W-Beam

This system consists of 12-1/4" wide corrugated steel rails secured to heavy metal posts with blocks between the posts and the rail. It is so-named because its profile resembles the letter "W" turned on its side.

Preservation Treatments

Preservation

This treatment places a high premium on the retention of all historic fabric through conservation, maintenance, and repair. It reflects a structure's continuum over time, through successive occupancies, and the respectful changes and alterations that were made.

Rehabilitation

This treatment emphasizes the retention and repair of historic materials, but allowing more latitude for replacement because it is assumed the property is more deteriorated prior to work.

Restoration

This treatment focuses on the retention of materials from the most significant time in the property's history, while permitting the removal of materials from other periods.

Reconstruction

This treatment establishes limited opportunities to re-create a non-surviving site, landscape, building, structure, or object in all new materials.

Safety Measures

Sight Distance

Sight distance is the length of the roadway ahead that is visible to the driver. The available sight distance on a roadway should be sufficiently long to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path.

Stopping Sight Distance

Stopping sight distance is the sum of two distances: a) the distance traversed by the vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied; and b) the distance needed to stop the vehicle from the instant the brake application begins.

Planning

American Association of State Highway and Transportation Officials

AASHTO is a professional nonprofit organization that works to develop design guidelines for roads and bridges in our cities, towns, and countryside. As part of these guidelines is the desire to ensure uniform safety throughout the United States – to have some standardization.

Context Sensitive Design

The terms *context sensitive design*, *context sensitive solutions*, and *flexibility in highway design* are used interchangeably by some. These terms all refer to the same process and result: a highway or transportation project that reflects a community consensus regarding purpose and need, with the features or the project developed to produce an overall solution that balances safety, mobility, and preservation of scenic, aesthetic, historic, and environmental resources. Context sensitive design involves a collaborative, interdisciplinary approach in which citizens are part of the design team.

Design Exception

Design exceptions are documented approvals allowing a legal divergence from standard road designs and management policies thereby reducing any claims of liability. They apply to specific features, such as a lane width or shoulder dimension, and not as a blanket exception for the whole road.

Flexible Design

The AASHTO Green Book makes reference to "reasonable guide values for maximum designs" and indicates that such guidelines are based primarily on traffic operational considerations as opposed to direct safety impacts. While the roadway designer should be encouraged to stay within the AASHTO Green Book guidelines, flexibility may be acceptable to meet unique local conditions.

Liability

An obligation to perform a specific duty.

Sovereign Immunity

The doctrine of Sovereign or Governmental Immunity in the United States is a common law concept that originated in the English courts. The sovereign, formerly the king or queen, is now in the U.S. the federal, state, and local governments. The doctrine generally holds that the sovereign may not be sued or that the sovereign may not be held liable, if it is sued.

Under the doctrine, several states in the United States have up to recent years been immune from suit and liability, unless the state had expressly waived its immunity in given situations. This form of defense began to deteriorate in the late 1950s, in part, by the passage of the Federal Tort Claims Act of 1946 (FTCA), which waived immunity for the federal government except for discretionary functions. Between 1957 and 1976, 29 state supreme courts took judicial action to abolish "large chunks" of sovereign immunity. State legislatures responded by enacting tort claims acts, sometimes restoring full immunity, but usually providing reduced immunity. Following the insurance crisis in the mid-1980s, over 40 states enacted tort reform legislation designed to further limit the liability exposure of state agencies.

Tort Liability

A situation in which an injury or harm has occurred, due to a breach of a pre-existing duty or obligation, resulting in potential exposure for damages.

Hanalei Community

Hanalei Town

For discussion purposes by the Community Advisory Committee on Kuhio Highway (Route 560), Hanalei town is the existing village of Hanalei that extends from Hanalei Trader to the Waioli Bridge.

Hanalei Town Center

For discussion purposes by the Community Advisory Committee on Kuhio Highway (Route 560), the town center is the section of Hanalei town that comprises the main business district, the boundaries of which extends from Hanalei Trader to the U.S. Post Office.

References

1) *A Guide for Achieving Flexibility in Highway Design.* AASHTO. May 2004
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7) *From Milestones to Mile-Markers.* Paul Daniel Marriott, 2004.
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9) *Introduction to Standards and Guidelines, Choosing an Appropriate Treatment for the Historic Building.* The Secretary of the Interior's Standards for the Treatment of Historic Properties. No Date.
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11) *Structures.* Compiled and written by Charles Houser Jr. and Nick DeCirce. No Date.

APPENDIX C

These Standards, developed in 1992, were codified as 36 CFR Part 68 in the July 12, 1995 Federal Register (Vol. 60, No. 133). They replace the 1978 and 1983 versions of 36 CFR 68 entitled, "The Secretary of the Interior's Standards for Historic Preservation Projects."

CODE OF FEDERAL REGULATIONS
TITLE 36--PARKS, FORESTS, AND PUBLIC PROPERTY
CHAPTER I-NATIONAL PARK SERVICE, DEPARTMENT OF THE INTERIOR

PART 68--THE SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES

s68.1 Intent
The intent of this part is to set forth standards for the treatment of historic properties, preservation, containing standards for preservation, rehabilitation, restoration, and reconstruction. These standards apply to all proposed grant-in-aid development projects assisted through the National Historic Preservation Fund.

s68.2 Definitions
The standards for the treatment of historic properties will be used by the National Park Service and State historic preservation officers and their staff members in planning, undertaking, and supervising grant-assisted projects for preservation, rehabilitation, restoration, and reconstruction. For the purposes of this part:

(a) ***Preservation*** means the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

(b) ***Rehabilitation*** means the act or process of making possible an efficient compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

(c) ***Restoration*** means the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

(d) ***Reconstruction*** means the act of process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

s68.3 Standards
One set of standards--preservation, rehabilitation, restoration, or reconstruction--will apply to a property undergoing treatment, depending upon the property's significance, existing physical condition, the extent of documentation available, and interpretive goals, when applicable. The Standards will be applied taking into consideration the economic and technical feasibility of each project.

(a) Preservation.

(1) A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

(2) The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

(3) Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

(4) Changes to a property that have acquired historic significance in their own right will be retained and preserved.

(5) Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

(6) The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

(7) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

(8) Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

(b) *Rehabilitation.*

(1) A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

(2) The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

(3) Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

(4) Changes to a property that have acquired historic significance in their own right will be retained and preserved.

(5) Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

(6) Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

(7) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

(8) Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

(9) New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

(10) New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

(c) *Restoration.*

1) A property will be used as it was historically or be given a new use which reflects the property's restoration period.

(2) Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will not be undertaken.

(3) Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

(4) Materials, features, spaces, and finishes that characterize other historical periods will be documented prior to their alteration or removal.

(5) Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize the restoration period will be preserved.

(6) Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials.

(7) Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.

(8) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

(9) Archeological resources affected by a project will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

(10) Designs that were never executed historically will not be constructed.

(d) Reconstruction.

(1) Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture, and such reconstruction is essential to the public understanding of the property.

(2) Reconstruction of a landscape, building, structure, or object in its historic location will be preceded by a thorough archeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.

(3) Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.

(4) Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color, and texture.

(5) A reconstruction will be clearly identified as a contemporary re-creation.

(6) Designs that were never executed historically will not be constructed.

APPENDIX D

PRELIMINARY ASSESSMENT OF BRIDGES ON ROUTE 560

In 2004, preliminary observations and assessments were made of the bridges along Route 560. These cursory evaluations are subject to a detailed, in depth bridge inspection consisting of detailed measurements, calculations and substructure analyses.

Hanalei Bridge: This bridge was recently rehabilitated. It should be diligently maintained and repaired as required.

Waioli Bridge: A preliminary inspection of the bridge revealed signs of early deterioration. The structure should be monitored on a regular basis for any progressive signs of serious deterioration.

Waipa Bridge: Vegetation in the stream and beneath the bridge structure should be regularly cleared. Conduct load-bearing tests on the structure to determine its current load-carrying capacity.

Waikoko Bridge: The hydraulic capacity of this bridge was seriously impaired when the original bridge collapsed from previous storms and high surf and a new bridge was constructed on top of the failed structure. The entire bridge should be replaced (meeting the design guidelines of this plan) to restore the original hydraulic capacity of the facility.

Lumahai Bridge: This contemporary two-lane bridge was built to AASHTO guidance/State standards. Regular repair and maintenance should be diligently administered.

Wainiha Bridges: These three bridges are undergoing study and design from current State funds. Construction funds should be sought for the project after design is completed. Community involvement is planned and expected to contribute to the final design of the bridges. The existing bridges, meanwhile, should be inspected every year.

Haena 1 Bridge: The north parapet of this bridge was struck and is severely damaged. Hence, the structural integrity of the bridge is in question and efforts should be taken to assess the long-term condition of the facility and its potential for rehabilitation or replacement.

Haena 2 Bridge: This bridge should be inspected in depth to determine its condition and priority for remedial action, such a preservation, rehabilitation, restoration, or reconstruction.

Manoa Stream Ford: This stream crossing should be retained, repaired as necessary, and regularly maintained. Construction of a pedestrian/bicycle crossing is recommended along side or near the existing ford for pedestrian/bicyclist safety purposes.

Limahuli Crossing: This stream crossing should be retained, repaired as necessary, and regularly maintained. Warning signs should be installed to warn motorists and pedestrians that the structure has no parapets or rails.

APPENDIX E

MEMORANDUM

TO: **Glen Koyama, Belt Collins**

DATE: **September 9, 2004**

RE: **Kuhio Highway Route 560 (Hanalei to Ha`ena, Kauai, Hawaii)**
Hawaii Historic Preservation Project -
A Preliminary Framework for Decision Making[1]

A. THE PROBLEM

Government officials are concerned that if improvements to Kuhio Highway from Hanalei to Ha`ena, Kauai include design features different from, or not identical to, standards established by the American Association of State Highway and Transportation ("AASHTO") Guides ("Green Book"), the Federal Highway Administration ("FHWA"), and the State Department of Transportation ("DOT") Design Manual,[2] then the State will be found liable *per se* in tort suits involving motor vehicle accidents because the government failed to meet required professional standards. In particular, government officials are concerned that the Hawaii Supreme Court's decision in *Taylor v. Rice*, 91 Haw. 60, 979 P.2d 1086 (1999) has been interpreted to mean that the government may not deviate from the most accepted, the most conventional, the most uniform, and the most "conservative" safety standards.

The problem is exacerbated by Hawaii tort law. The State has waived its sovereign immunity and agreed to be sued "in the same manner and to the same extent as a private individual under like circumstances."[3] Hawaii has also retained a modified form of joint and several liability for motor vehicle accidents. Haw. Rev. Stat. §663-10.9. The State may be found only partly liable (for highway design), yet end up paying most of sometimes substantial judgments because the joint tortfeasor either lacks funds or has reached the limits of his / her insurance policy.

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[1] This memo is a preliminary outline of the topic and should not be taken as specific legal advice on any particular design question.

[2] The State DOT standards include the AASHTO green book, FHWA guides, Hawaii judicial decisions, Hawaii Attorney General opinions, and internal DOT policy memos.

[3] Haw. Rev. Stat. §662-2.

The problem with conventional and uniform highway design standards is that they are made for general application throughout the country. The standards may be inappropriate for a particular location. They may alter or disregard local scenery, traditions, and customs. As infrastructure expands over time, traditional community values, places, and history are displaced.

B. THE ISSUE

The issue presented here is whether existing guidelines (recognized by AASHTO and FHWA and adopted by the State) for the design of Kuhio Highway improvements are flexible enough to be consistent with and keep the traditional and historical character of the community without increasing the risk of tort liability. The objective is not to deviate from the "standard," but to recognize and use the flexibility of ranges *within* the standards that already exist. For federally funded FHWA projects in the past, a single uniform design was generally applied "across the board" in *all* circumstances. This is no longer valid, accurate, nor wise.

- "In the view of AASHTO, established processes and design guidance are not in conflict with the movement [for design flexibility]. Furthermore, a well-designed, context-sensitive design solution need not increase the risk of a tort lawsuit to an agency. AASHTO supports the concepts and principles of flexibility in highway design and feels that all professionals responsible for highway and transportation projects should understand how to accomplish a flexible design solution with current design processes and approaches. *AASHTO Guidebook*, May 2004, page xv.

- "There is significant flexibility in the presentation of geometric design values published in the 2001 update to the AASHTO publication *A Policy on Geometric Design of Highways and Streets"* ("AASHTO Green Book"). *Id.* at xvi.

C. HAWAII STATUTES

1. State Tort Liability Act: Waiver of Sovereign Immunity; Exceptions

The State of Hawaii waives its sovereign immunity and agrees to be sued "in the same manner and to the same extent as a private individual under like circumstances. . . ."[4]

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[4] HRS § 662-2. Waiver and Liability of State.

The State hereby waives its immunity for liability for the torts of its employees and shall be liable in the same manner and to the same extent as a private individual under like circumstances, but shall not be liable for interest prior to judgment or for punitive damages.

However, the State makes an exception and is not liable in tort for "the exercise or performance or the failure to exercise or perform a *discretionary function* or duty on the part of a state officer or employee." Discretionary functions are distinguished from "ministerial" functions. Ministerial functions involve obedience to already established instructions compared to discretionary actions, like policy decisions which require judgment among permissible choices or special skills, not fixed rules.[5] Where a policy decision not to reconstruct an entire bridge involved the weighing of priorities at the higher levels of government, the court found that the choice involved a "discretionary function."[6] However, where individual road improvements were made at an operational level ("an upgrade"), not involving a broad public policy decision, the court found the discretionary function exception did not apply.[7]

In *Taylor v. Rice*, 91 Haw. 60, 979 P.2d 1086 (1999) (discussed below), the Hawaii Supreme Court found that where the DOT had notice that a particular guard rail leading to bridges was potentially dangerous because an earlier accident (on Kuhio Highway) indicated that the guard rail could cause a car to "ramp" and turnover, the DOT was obligated to fix the problem when repairing bridges on a routine basis. Since the repair was not expensive relative to the budget and other maintenance requirements, the repair could be done on a simple operational level and did not require any policy decision.

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[5] Haw. Rev. Stat. § 662-15. Exceptions [Discretionary Functions].

This chapter [State Tort Liability Act] shall not apply to:

(1) Any claim based upon an act or omission of an employee of the State, exercising due care, in the execution of a statute or regulation, whether or not such statute or regulation is valid, or *based upon the exercise or performance or the failure to exercise or perform a discretionary function* or duty on the part of a state officer or employee, whether or not the discretion involved has been abused. (emphasis added)

. . . .

[6] *Rothschild v. State*, 66 Haw. 76, 80-81, 655 P.2d at 881 (1982).

[7] *Taylor v. Rice*, 91 Haw. 60, 979 P.2d 1086 (1999).

2. Tort Actions

By statute, Hawaii retains a form of joint and several tort liability[8]:

> *relating to the maintenance and design of highways including actions involving guardrails, . . . and any other highway-related device upon a showing that the affected joint tortfeasor was given reasonable prior notice of a prior occurrence under similar circumstances to the occurrence upon which the tort claim is based.*

HRS § 663-10.9(4).

Thus, even without the *Taylor v. Rice* decision, the State faces the risk of joint and several liability for highway design where the State was *"given reasonable prior notice of a prior occurrence under similar circumstances to the occurrence upon which the tort claim is based." Id.*

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[8] HRS § 663-10.9. Abolition of joint and several liability; exceptions.
Joint and several liability for joint tortfeasors as defined in section 663-11 is *abolished* ***except*** in the following circumstances:

. . . .

(2) For the recovery of economic and noneconomic damages against joint tortfeasors in actions involving:

. . . .

(F) Torts relating to motor vehicle accidents except as provided in paragraph (4);

(3) For the recovery of noneconomic damages in actions, other than those enumerated in paragraph (2), involving injury or death to persons against those tortfeasors whose individual degree of negligence is found to be twenty-five per cent or more under section 663-31. Where a tortfeasor's degree of negligence is less than twenty-five per cent, then the amount recoverable against that tortfeasor for noneconomic damages shall be in direct proportion to the degree of negligence assigned; and

(4) For recovery of *noneconomic damages in motor vehicle accidents* involving tort actions *relating to the maintenance and design of highways including actions involving guardrails, utility poles, street and directional signs, and any other highway-related device upon a showing that the affected joint tortfeasor was given reasonable prior notice of a prior occurrence under similar circumstances to the occurrence upon which the tort claim is based.* In actions in which the affected joint tortfeasor has not been shown to have had such reasonable prior notice, the recovery of noneconomic damages shall be as provided in paragraph (3).

. . . .

D. DEPARTMENT OF TRANSPORTATION: HAWAII ADMINISTRATIVE RULES:

The Hawaii State Department of Transportation ("DOT") rules require highway design to follow the AASHTO "green book" and the State Highway "Manual." H.A.R. §§ 19-127.1-1 and 1-2.[9] Deviations involving *federal* highway funds must be approved by the Federal Highway Administration. Deviations involving only *State* highway funds must be approved by the State Director of Transportation. H.A.R. § 19-127.1-12.[10]

The AASHTO guidelines and State Highway Manual are the engineering standards that drive state highway design and repair in Hawaii. The guidelines and manual are accepted as the authoritative professional canon. Both are revised and updated from time to time.

Congress has provided that for federal aid projects not on the National Highway System, states have the flexibility to develop and apply criteria they deem

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[9] H.A.R. § 19-127.1-1. Scope:

This chapter shall apply to all persons and agencies who design, construct, and maintain facilities which are, or are intended to become, public streets and highways in the State. Existing public streets and highways which do not conform to the guidelines set forth in this chapter streets and highways, or major portions thereof, shall conform to this chapter, where conformance is deemed practicable by the director.

H.A.R. § 19-127.1-2. Definitions:

"AASHTO guides" means the current edition of the "Guides of the American Association of State Highway and Transportation Officials" published by the American Association of State Highway Transportation Officials.

"Manual" means the Hawaii Statewide Uniform Design Manual for Streets and Highways and Standard Plans.

[10] H.A.R. § 19-127.1-12. Construction and maintenance guidelines:

The construction and maintenance guidelines established by this chapter should be followed as closely as is practicable in the construction, reconstruction, and maintenance of all highways, streets, and roads undertaken either by state or county authorities. *All deviations from these guidelines which affect highway safety shall not be made unless prior approval of these deviations has been granted by the director.* Minor deviations may be made with the approval of the traffic engineer from the state or county agency having jurisdiction. (Emphasis added)

appropriate in order to preserve historic and scenic values.[11] In 1997 the Federal Highway Administration ("FHWA") published its own "Flexibility in Highway Design" guide.

Interestingly, the DOT rules provide that the "design guidelines for safety features, such as sight distance, horizontal and vertical curvature, width of lanes and shoulders, spacing of decision points, bridges, guardrails, and poles, *should be the minimum guidelines established by the AASHTO guides and the manual.*"[12] (emphasis added). This is not insignificant. The entire range of values under the AASHTO guides are acceptable. The minimum values within the range are safe. There is no presumption that the "higher" part of the range is safer or "better."
[insert Dan Marriott authority]

It may be difficult to overcome the assumption that the "higher" part of a range is "safer" when it may only be different in differing circumstances. Even the Supreme Court, quoting the DOT Design Manual infers that when a highway is repaired to meet "contemporary engineering standards," that, for example, a "guardrail's end treatment and length" are improved by being longer.[13]

E. CASE LAW

1. Hawaii

In *Taylor v. Rice*, 91 Haw. 60, 979 P.2d 1086 (1999), a drunk driver hit the buried approach end of a highway guardrail, killing two passengers and injuring the driver. The State was held 20% liable for failing to maintain the guardrail in a safe condition and, based on the State's prior notice of danger, the State was held jointly and severally liable. The Court rejected the driver's intoxication as a superceding cause. The State's failure to upgrade the guardrail during prior resurfacing did not come within the discretionary function exception to the waiver of sovereign immunity.

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[11] Intermodal Surface Transportation Efficiency Act ("ISTEA") of 1991 and the National Highway System Designation ("NHS") Act of 1995.

[12] H.A.R. § 19-127.1-5. Geometric design:

> The design guidelines for safety features, such as sight distance, horizontal and vertical curvature, width of lanes and shoulders, spacing of decision points, bridges, guardrails, and poles, *should be the minimum guidelines established by the AASHTO guides and the manual.* (emphasis added)

[13] *Taylor v. Rice*, 91 Haw. 60, 78-79, 979 P.2d 1086, 1104-1105 (1999).

More specifically, the Hawaii Supreme Court held that under the 1993 version of Haw. Rev. Stat. §663-10.9, a prior accident on Kauai was not required to be identical to the accident at issue in order to put State on reasonable prior notice of defective guardrails on Kuhio Highway. *Id.* at 79. The Court found the State jointly and severally liable for injuries and damages from a car accident involving a guardrail that had not been upgraded and "brought into compliance with contemporary engineering standards." Applying the two part test for negligence in *Mitchell v. Branch*, 45 Haw. 128, 132 363 P.2d 969, 973 (1961), the Court found that (1) the State's failure to improve the guardrail was a substantial cause of the party's injuries, and that (2) the driver's own actions were not a superceding cause relieving the state of liability.

The Court rejected the State's claim that the decision not to repair the guardrail fell within the discretionary function exception doctrine for broad public policy decisions; rather, the decision was a routine operational maintenance decision that should not be shielded from normal tort claims. Unlike a legislative or board level decision to replace an entire bridge which involves broad public policy decisions, weighing alternatives, evaluating competing needs, and making choices committed by law to the discretion of public officials, the decision to "fix" a particular guardrail (or guardrails like the one "causing" a prior accident) are "operational level activities" that do not involve competing public values.

Thus, when the State has been put on notice of a safety problem (i.e. "prior occurrences under similar circumstances"), the State has a duty at a minimum to address and "fix"the problem. The problem can not be left to be repeated elsewhere.

2. Other Jurisdictions

In *Tennessee*: *Helton v. Knox County, Tennessee*, 922 S.W.2d 877, 881 (Tenn. Sup. Ct. 1996), the Tennessee Supreme Court upheld the county's decision *not* to install standard guardrails despite a recommendation of state inspectors, because the decision, based upon "costs and concern for the preservation of this historic bridge," was a discretionary function that involved weighing of *public policy* considerations.

Maui's Hana Highway was able to retain its one-lane bridges based on public policy considerations for the bridge's historic design. This was not the first time historic design considerations overcame uniform engineering criteria. See AASHTO guidelines.

In *Boyman v. United States*, 820 F.2d 1393 (4th Cir. 1987) and *Autery v. U.S.*, 992 F.2d 1523 (11th Cir. 1993), federal circuit courts held that decisions about safety measures to be applied in national parks and how to execute them, involve balancing the same considerations that inform all policy decisions regarding management of national parks: safety, aesthetics, environmental impacts, and available financial resources.

In *Higgins v. State of California*, 54 Cal. App. 4th 177 (1997), the California court held that the state met the standard of proof for design immunity under certain

specific conditions. A public entity will generally not be found liable for a dangerous condition on public property where it can show:

> (a) a causal relationship between the plan or design and the accident; (b) discretionary approval of the plan or design prior to construction or improvement, and (c) substantial evidence supporting the reasonableness of the design. *Id.*

In proving the reasonableness of the design, compliance with design criteria would usually prove sufficient, but where the design deviates from such criteria, documented approval of design exception, based on sound engineering, would be necessary.

In *Aguehounde v. District of Columbia*, 666 A.2d 443 (D.C. App. 1995), the court found that discretionary conduct is not confined to the policy or planning level, but is judged on the nature of the actions taken and on whether they are susceptible to policy analysis.

In *Keegan v. State of Utah DOT*, 896 P.2d 618, 626 (Ut. Sup. Ct. 1995), the Utah Supreme Court held that the Utah DOT exercised a 'discretionary function' in deciding during surface overlay projects not to raise the median barrier. The evidence showed that the decision was based upon a comprehensive safety study report, including study of accident rates, involving a determination of not only the degree of safety that would be provided by various options considered, but also what degree of safety would be an appropriate goal given time and cost constraints. Additional evidence was the preparation by the project design engineer of a cost-benefits report, based upon the safety study.

Thus, courts across the country have already adopted a flexible view to highway design that does not require a "one size fits all" approach. The courts do require that the designs follow and meet certain basic criteria.

F. Actions to Protect Design and Reduce Liability

Courts will look at a number of key factors in determining whether a design issue should lead to liability. If the following considerations are addressed in the order listed, the tests established by the courts should be met and pubic officials should be able to say with confidence that the design is safe, reasonable, and protects traditional and historic community values:

1. Past safety problems must be fixed. Where there have been accidents which put the government on reasonable notice of a design or engineering problem due to "prior occurrences under similar circumstance," the problem **must be** fixed. Flexible design criteria may apply, but the situation can not be left as it was before the accident. *Taylor-Rice*

2. Is the final design the result of a broad policy and discretionary decision *rather than* an individual ministerial or operational action or requirement? *Julius Rothschild* and *Aguehounde;* not *Taylor-Rice*.

3. Has the design taken into account and integrated all the factors: safety, aesthetics, community traditions, environmental impacts, financial resources, contemporary design considerations, time constraints, previous studies, institutional experience, and any cost-benefit analysis?
NOTE: This includes historic and traditional values. Explicitly state the importance of historic values to the community (e.g. preserve town's rural character). Is the design choice part of a coherent overall plan that integrates these considerations together? *Boyman*

4. Is the overall design choice "reasonable?" Does it reflect sound and accepted engineering practices? *Higgins*

5. Have the circumstances, considerations, and choices been well documented? Designers and the government should carefully document the specific circumstances of the project, the choices available, and the importance and weight of different factors. In balancing the various considerations, and choosing a particular design, the decision maker should articulate the reasoning. The explanation should be clear. Others should be able to repeat the process and understand the judgment (even if they might weigh the factors differently). *Bowman*

6. Is the driving experience along the highway a consistent experience without sudden surprises or upset expectations?
Notice: For historic preservation highways, place signs at the beginning of the historic area giving drivers notice of the highway's historic significance and of any special conditions ahead.

7. Conduct qualitative or safety studies of the problem if it possible. *Keegan*

F. CONCLUSION

Increasingly, courts are recognizing that safe and efficient transportation services require flexible highway design standards in order to conserve and enhance the environmental, scenic, historic, and community resources of our land. Safe design can be accomplished in a variety of ways, not just following one uniform standard in a world that is not confined to one set of conditions.

APPENDIX F

THE SENATE
TWENTY-THIRD LEGISLATURE, 2005
STATE OF HAWAII

S.B. NO. 1876 S.D. 2 H.D. 2 C.D. 1

A BILL FOR AN ACT

RELATING TO HIGHWAYS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. Hawaii's rural communities are the heart and soul of the islands, reflecting the aloha spirit and natural beauty that are the essence of our State. As urbanization spreads throughout Hawaii, our rural communities are at risk of losing their unique identities. The imposition of uniform, conventional highway design can significantly alter and detract from the historical identities of these communities.

During the past decade, highway design has undergone significant change. Today, engineers and planners are employing greater flexibility in the way they design road projects through context-sensitive solutions and design. Through the use of the Federal Highway Administration *Flexibility in Highway Design* book, and the American Association of State Highway and Transportation Officials *Green Book*, and *A Guide for Achieving Flexibility in Highway Design* (May 2004), engineers and planners are able to consider more than safety and efficiency when building new roads or reconstructing old roads. These additional design considerations include the environment, scenic and historic preservation, community effects, and aesthetics.

Congress expressly acknowledged the importance of flexible highway design sensitive to the surrounding environment, especially in historic and scenic areas. Section 1016(a) of the Intermodal Surface Transportation Efficiency Act of 1991 allows approval of projects designed to allow for historic and scenic value preservation, while ensuring safe use. Highway design under the National Highway System

Act (other than interstates) may consider the constructed and natural environment of the area, and the environmental, scenic, aesthetic, historic, community, and preservation impacts of the project. The National Highway System Act authorizes states the flexibility to develop and apply criteria they deem appropriate for federal-aid projects not on the National Highway System. This federal policy framework recommends early identification of critical project issues and encourages thorough consideration of community concerns and input prior to any major decision that could limit other options.

Despite the flexibility under the Federal Highway Administration, American Association of State Highway and Transportation Officials, and federal law, Hawaii's state department of transportation (DOT) has been reluctant to develop and implement flexible design processes and guidelines that consider historical, scenic, and environmental impacts in highway construction.

The legislature adopts the concept of flexible highway design and determines as a matter of policy that the department should address these concerns by developing guidelines that:

(1) Create a process to weigh community traditions, values, and practices, and environmental, aesthetic, and social impact with safety, financial, political, social, and economic policy considerations including the department's own institutional experience, cost benefit analysis, and relevant studies;

(2) Lead to an overall highway design choice that is "reasonable", reflects sound and accepted engineering practices, provides a consistent driving experience, and includes reasonable notice to highway users;

(3) Recognize the variety of conditions that different projects may present;

(4) Require documentation of the process and reasoning leading to the flexible design decision, including the circumstances of each project, the choices available, and the considerations reviewed, as well as a complete explanation for the decision itself; and

(5) Incorporate qualitative and safety studies where advisable.

The legislature expressly finds that flexible designs are not themselves less safe than earlier engineering practices. Rather,

flexible design is simply part of the ongoing evolution within engineering that takes a broader range of considerations into account than may have been done in the past. Flexible design is not inherently less safe than some different or prior design; flexible design is a different and broader combination of factors to be considered in being safe.

To this end, the legislature determines as a matter of policy that when the government chooses to use flexibility in highway design, no legal claims or causes of action should be made against the State, DOT, the counties, and officers, employees, or agents of the State, DOT, the counties, or a public utility regulated under chapter 269 that places its facilities within the highway right of way, for the decision to select or apply flexible highway design.

The legislature further finds that community organizations, including the Alliance for the Heritage of East Maui, the Hanalei Road Committee on Kauai, and the Hamakua-Honokaa Heritage Corridor on the Big Island have been working on and support scenic byway or heritage corridor programs. The upper Kona road on the Big Island and Ka Iwi coastal highway on Oahu are also under review as important scenic and historic corridors. These groups support flexible design in highway construction to meet their community's desire to protect and preserve natural, cultural, historic, and scenic values and resources.

This Act also provides for a limitation of liability for government entities by providing immunity for the decision whether to use flexible alternatives when a flexible alternative design guideline is selected in accordance with this Act and does not extend to subsequent improper design, construction, maintenance, or improvements.

Public utilities are also protected against liability for the decision to apply flexibility in highway design. For example, if the decision to utilize a specific alternative standard requires the use of a particular type of utility pole and precludes the use of another type, the utility would not be liable for use of the required pole. This immunity similarly applies only to the selection or application of a flexible highway design and does not relieve the utility from its subsequent responsibility of safe design, construction, and maintenance.

The purpose of this Act is to encourage flexibility in highway design that ensures that road and bridge projects adequately meet the State's transportation needs, exist in harmony with their surroundings, are safe and cost-effective, and add value to the communities they serve.

SECTION 2. Chapter 264, Hawaii Revised Statutes, is amended by adding a new section to be appropriately designated and to read as follows:

"**§264- Flexibility in highway design; liability of State, counties, and public utilities.** (a) If a highway, including any bridge, principal and minor arterial road, collector and local road, or street, requires new construction, reconstruction, preservation, resurfacing (except for maintenance surfacing), restoration, or rehabilitation, the department of transportation with regard to a state highway, or a county with regard to a county highway, may select or apply flexible highway design guidelines consistent with practices used by the Federal Highway Administration and the American Association of State Highway and Transportation Officials. Flexibility in highway design shall consider, among other factors:

(1) Safety, durability, and economy of maintenance;

(2) The constructed and natural environment of the area;

(3) Community development plans and relevant county ordinances;

(4) Sites listed on the State or National Register of Historic Places;

(5) The environmental, scenic, aesthetic, historic, community, and preservation impacts of the activity;

(6) Access for other modes of transportation, including but not limited to bicycle and pedestrian transportation;

(7) Access to and integration of sites deemed culturally and historically significant to the communities affected;

(8) Acceptable engineering practices and standards; and

(9) Safety studies and other pertinent research.

(b) Any other law to the contrary notwithstanding, the following parties shall be immune from liability for personal injury, death, or property damage in any accident arising out of the decision to elect or apply flexibility in highway design pursuant to this section and consistent with the practices used by the Federal Highway

Administration and the American Association of State Highway and Transportation Officials:

(1) The State;

(2) The department of transportation;

(3) The counties;

(4) Any public utility regulated under chapter 269 that places its facilities within the highway right of way; or

(5) Any officer, employee, or agent of an entity listed in paragraphs (1) to (4).

(c) The immunity from liability provided in subsection (b) applies only to the decision to select or apply flexibility in highway design pursuant to this section and does not extend to design, construction, repair, correction, or maintenance inconsistent with subsection (a)."

SECTION 3. (a) Before June 30, 2006, the director of transportation shall establish flexible highway design guidelines to govern new construction, reconstruction, preservation, resurfacing (except for maintenance surfacing), restoration, or rehabilitation of bridges, principal and minor arterial roads, collector and local roads, and streets. The guidelines shall include and address the considerations set forth in section 2 of this Act.

The guidelines shall also provide for documentation of the facts, circumstances, and considerations involved in the flexible design decision, including an explanation of the process and the reasoning that led to the decision.

(b) The director shall establish a process to allow flexible highway design to be considered when designing improvements on the following highways:

(1) Hana highway, east Maui;

(2) Hanalei road, north Kauai;

(3) Hamakua-Honokaa heritage corridor, island of Hawaii;

(4) Upper Kona road, island of Hawaii; and

(5) Ka Iwi coastal highway, eastern Oahu.

(c) In establishing the guidelines described under this section, the director shall solicit and consider the views of organizations and elected officials, including but not limited to:

(1) Those with expertise in:

(A) Environmental protection;

(B) Historic preservation;

(C) Scenic conservation; and

(D) Bicycle and pedestrian transportation;

(2) Community planning organizations;

(3) The State historic preservation office of the department of land and natural resources; and

(4) The Federal Highway Administration.

SECTION 4. New statutory material is underscored.

SECTION 5. This Act shall take effect on July 1, 2005.