

HAWAIIAN CONNECTIONS



NEWSLETTER OF THE HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

VOLUME 4, No. 4

WINTER 2002

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Please pass this on to other interested parties in your office.



Third Annual Superintendent/Overseer Conference

By Matthew Alonzo, Hawaii LTAP

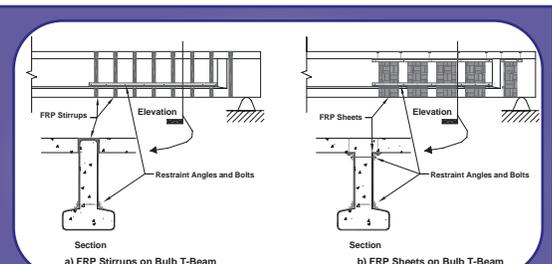
Hosted by Kauai County, the third annual Superintendent/Overseer Conference bridged the ideas of each county throughout the state. The conference held October 9 - 11, 2002.

Like the past two conferences, this year's meeting was a huge success. "...Our camaraderie extends beyond the conference. As we meet new people, our base grows and we can share our knowledge and ideas," said Eddie Emoto, District Supervisor of the Maui Department of Public Works and Waste Management. He sees the importance of this conference and encourages the development of ideas and practices to be shared with each county. "Without conferences like this, we lose contact and end up back to square one."



This year, Hawaii LTAP invited "better mousetrap" inventions from each county. The Spring 2002 Hawaiian Connections newsletter featured some of the inventions. The first annual "Got a Better Mousetrap?" award recognized Edwin Bonnell from Lahaina Maui for his outstanding invention. He devised the WEEPHOLE CLEANER that is used to clean weep holes in the Federal Flood Control Projects. The photo on this page is of Director of Hawaii LTAP, C.S. Papacostas congratulating Maui Superintendent Leonard Costa who received a certificate of accomplishment for his OCEAN OUTLET & CLEANER SHOVEL. Michael Santos, also from Maui received a certificate of accomplishment for his WELDING CRAWLER. *Continue on page 9.*

Leonard Costa, Maui County Highways Superintendent also saw the importance of putting ideas into action, "We can never tell when one small or seemingly simple idea may create a major impact. Little things inspire us to bigger and better ideas."



FRP for Deficient Bridges p. 6

AASHTO Launches Bench-Scale Testing of Rolled Erosion Control Products (RECP)

Tandem NCHRP 20-7 Project to Correlate Results

WASHINGTON, DC -- AASHTO's National Transportation Product Evaluation Program (NTPEP) is launching a new program to help State DOTs prequalify rolled erosion control products; commonly known as RECPs. The NTPEP program subjects products to "bench-scale" tests which gauge performance index properties on RECPs. The guidelines were developed by the Erosion Control Technology Council (ECTC), a collaborative organization representing the industry at-large. In May 2002, AASHTO and ECTC signed a cooperative agreement for purposes of furthering NTPEP.

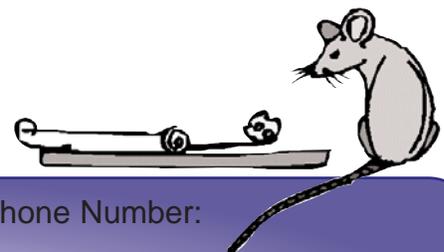


The NTPEP Project Panel on RECP is chaired by Peter Kemp, Wisconsin DOT; his vice chairman is Steven Hall of Tennessee. With Industry representation vis-à-vis ECTC, they authored a Project Work Plan which provides a framework to test and prequalify RECPs for use by State DOTs. That document is found on the NTPEP website at WWW.NTPEP.ORG.

To address concerns of correlation between the new "bench-scale tests versus large-scale tests", the NTPEP Oversight commissioned an NCHRP study to correlate test results. That project will coincide with early product submissions to the NTPEP program. Bench-scale test results cannot be used for design purposes, but can be used to assess durability of a product and compare field performance. The NCHRP panel is composed of state DOT practitioners, industry and researchers expert in the field.

NTPEP is an engineering technical-service program established in 1994. For more information about NTPEP or the newly launched RECP program, contact Mujeeb Basha at (202) 624-3695 or at mujeebb@ashto.org.

Got a Better Mousetrap?



Have you or one of your co-workers built a better mousetrap recently? A modified gadget? An improved way to do a job?

Please let us know about it. The best entries will be featured in a future issue of Hawaii Connections.

Name and Phone Number:

Invention:

Agency:

Please fax this form to (808) 956-8851



2002 Pre-Conference Meeting

Honolulu, Hawaii

By Gail Ikeda, Hawaii LTAP

On October 21 - 22, 2002, Hawaii LTAP held a Pre-Conference Planning Meeting for the upcoming 2003 National LTAP/TTAP Conference in July 28 - 31, 2003 in Honolulu, Hawaii. The planning committee consisted of members from the National LTAP Clearinghouse, Region 9, the Hawaii LTAP Advisory Committee and staff. Region 9 includes Hawaii, California, Arizona and Nevada.

The first day of the meeting, Cheryl Fernandez and Alan Kinuhata of the Sheraton Waikiki provided a walk-through tour of the Sheraton properties. Each room is surrounded by the calm beautiful Waikiki beach that have many green sea turtles swimming near by. The picture here was taken of the planning committee on the lanai of one of the cocktail rooms before we headed up to the breath-taking view of the Hanohano room. Hawaii LTAP would like to extend a warm Aloha to Cheryl and Alan for the tour and answering all our concerns for the 2003 Conference.

Each region was given the opportunity to suggest session topics for the conference. The planning committee discussed and compiled the list of brainstorm topics and categorized them in four areas, Administration, Management, Technical/Operational and Others. This process of filtering the topics was very tedious and time consuming.

The last day of the Pre-Conference Planning meeting was spent assigning priority values to each topic. The high priority topics were selected by voting and placed on the National Conference tentative agenda. This impressive list of session topics will be presented at the Winter Transportation Research Board meeting in January 2003 for adjustments and approval.

To encourage the development of camaraderie throughout all LTAP/TTAP centers, the committee discussed possible team-building activities to incorporate the theme, "Riding the Wave to the Future." The list of topics and ideas are very promising and will ensure a successful response from conference attendees.

Continue on page 4.



Pre-Conference Meeting *(continued from page 3)*



As host, the Hawaii LTAP staff shared their aloha and took the Pre-Conference planning committee on a tour of Oahu. During the weekend before the conference Hawaii LTAP took some members on a rigorous schedule of site seeing. The Makapu'u lighthouse hike was the first activity. Some committee members even joined us directly from their flights into Hawaii. A few hours were spent power shopping and relaxing at the newly renovated Aloha Tower Marketplace Saturday evening.



Group picture at the Pali Lookout

On Sunday, the committee embarked its cross-island journey. We stopped at the Pali Lookout that oversees the lush Windward side of Oahu. It was even a first time for some of the locals! We continued our quest to Kualoa Beach Park to see Chinaman's Hat (Mokoli'i Island) and ventured off north to Laie Point. Before we hit the waves at Ehu Kai the committee experienced "local kine grinds" at Giovanni's Shrimp Shack. The shrimp was ono! We spent a few hours at the beach and got some sun and continued the expedition to Matsumoto Shave Ice, a local tradition when you go north shore. Nearing the end of the packed journey, we stopped over at the Dole Pineapple Plantation for some delectable pineapple treats and continued back to the Sheraton Waikiki.

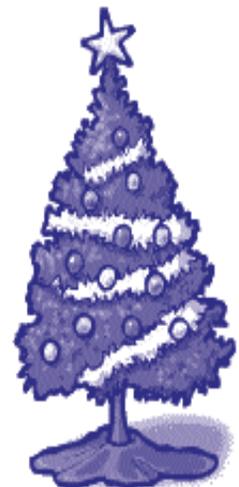
Hawaii LTAP would like to extend a warm Mahalo to everyone for their contribution in planning the 2003 National LTAP/TTAP Conference. The company was great and we look forward in see all of you next July 2003.

Aloha



Group picture at Laie Point

After all that sightseeing, the committee was taken on the hike to the summit of Diamond Head just in time for a sunset in Hawaii Monday evening. On the last evening of the conference Hawaii LTAP took the members to Tantalus to see the city lights. It was nice and some even said it looked like a "mini New York."



NEWS FROM OUR PARTNERS...**Hawaii Asphalt Paving Industry**

Currently the Hawaii Asphalt Paving Industry (HAPI) is busy working on setting up a Golf Tournament in order to raise funds to establish a scholarship in the name of Steve Fong who passed away earlier this year after a long bout with cancer. Steve's wife Yvonne will be assisting HAPI in getting this scholarship program off the ground. The Cement and Concrete Products Industry (CCPI) will also assist HAPI in bringing about the Golf Tournament and hopefully this will become an annual event. As of now the tournament is set for July 25th at the Pearl Country Club and all interested in participating need to contact Lisa Economy at 808-961-3196.

HAPI has been spending much of its time the past few months researching pavement design concepts, analyzing actual bus loadings and bringing these concepts to the attention of consulting engineers throughout the state. Asphalt pavements, if properly designed, can withstand the traffic and loadings now and in the future; the key lies in understanding what the sub base and base course thicknesses should be when designing the pavement structure.

In addition, HAPI is continually working on our Asphalt Pavement Design Guide; CD and web version. Those who attended our NAPA (National Asphalt Pavement Association) HMA Design Guide Seminar back in July have received the NAPA version and are quite impressed with the magnitude of information it contains. HAPI along with Agency personnel and UH Professor Randy Akiona will be working with Professor Joe Mahoney and Steve Meunch, University of Washington -- authors of the NAPA Guide -- to bring about a Hawaii version. Stay tuned for HAPI's Guide for Asphalt Pavements...

Please enjoy a safe and wondrous 2003!

Lisa G. Economy
Exec. Director, HAPI

**Concrete and Cement Products Industry**

It has been a privilege to combine resources with LTAP in our common goal of providing technical assistance and training to the front line people. CCPI's goals and objectives are "to collectively promote, protect and advance the welfare and interests of the cement and concrete products industry." CCPI promotes this through educational programs, various concrete and masonry seminars, maintenance of a technical library, administering of ACI Certifications, and providing technical information to architects, engineers, government agencies, contractors, and other interested groups. The partnering of ideas from different perspectives has often times lead to great 'concrete solutions.'

Today, with so many innovations and technical advances, we're more committed than ever to helping people achieve a new level of performance. The real enjoyment for me has been the interaction with those whom we serve. As president of CCPI, I feel very honored and privileged to be associated with a well-respected, professional group of people in the LTAP network and the construction industry. I look forward to further education developments in the New Year and working with LTAP in that direction.

Mahalo!
Wayne Kawano



FRP Strengthening of Structurally Deficient Bridges

By Si-Hwan Park, Ian N. Robertson and H. Ronald Riggs, University of Hawaii

Although fiber-reinforced polymers (FRP) have been used widely in the aerospace and automobile industries, their use in structural engineering applications, such as bridges and buildings, is relatively new. Engineers and contractors in this area, therefore, are not as familiar with the material as with the traditional materials of concrete, steel, and wood. Nevertheless, FRP is being used more and more frequently for structural engineering applications because of its advantages such as high stiffness-to-weight and strength-to-weight ratios, corrosion resistance, and constructability. The objective of this study was to provide the Hawaii Department of Transportation with a 'primer' for the use of FRP in strengthening structurally deficient concrete bridges, thus increasing the engineer's familiarity with the products, and contributing to the consideration of FRP for future projects.

To date, many of the applications of FRP have been in strengthening and retrofitting existing structures made of reinforced concrete or masonry, although some applications have also been made to new construction where FRP is the primary structural material. One area in which FRP is being used increasingly is the strengthening of structurally deficient concrete bridges, in which a major goal has been to increase the load rating of old bridges without adversely affecting bridge aesthetics. Since the early applications in Europe (Ibach Bridge in Lucerne, Switzerland, for example) and Japan, application in the U.S. has increased substantially: South Broadway Railroad Overpass in Wichita, Kansas; and Boone County bridges, Missouri, to name a few. For the Kings Stormwater Channel Bridge in Salton Sea, California, FRP was used as the primary structural material for decks and beams.

FRP consists of two basic materials: fibers and a polymeric resin. The fibers are encased in the

resin and provide tensile strength, while the resin provides shear strength and transfers loads between the fibers. The three primary types of fibers are glass, aramid, and carbon. Carbon fiber is now a popular choice although more expensive than glass, because it is stronger and stiffer, and has better fatigue and creep characteristics. Polyester, epoxy, and vinyl ester resins are common choices for resins. Epoxy resins, although more expensive, have several advantages over polyester resins: they have better adhesiveness and fatigue characteristics, and have fewer problems with air emissions. Typical FRP systems for bridge strengthening include: wet lay-up systems, where dry, flexible fiber sheets are saturated on-site and bonded to the concrete; prepreg systems, where fiber sheets are impregnated with resin off-site but cured on-site; and precured systems, where, for example, pultrusion plates are manufactured offsite and bonded to the concrete. This last system is directly analogous to the strengthening system that involves attaching a steel plate to the concrete structure to increase, for example, bending capacity.

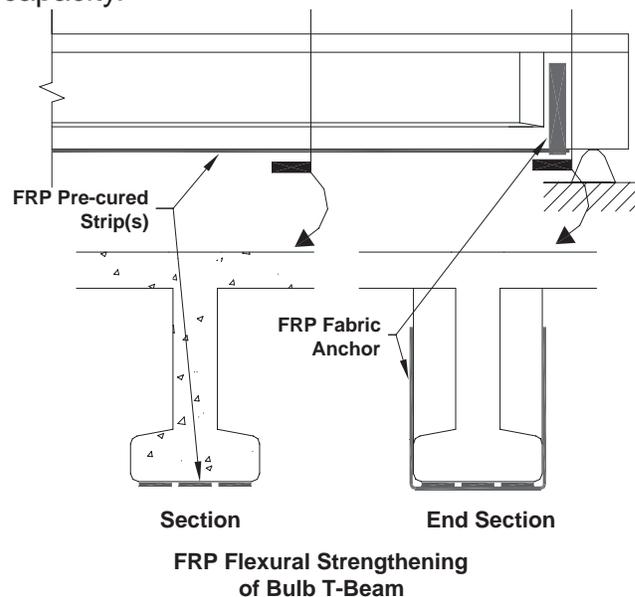


Figure 1: Typical flexural strengthening of AASHTO-type girder bridge

As FRP systems are primarily good at resisting tensile forces, they are used much as steel reinforcement to increase the flexural and shear capacity. Flexural strengthening of precast AASHTO-type girders, a common structural system for concrete bridges in Hawaii, involves bonding FRP strips to the exterior of the tension side (the soffit of the beam bulb, see Figure 1) of the member; the strips run longitudinally along the length of the member. Just as with steel reinforcement, care must be taken to ensure proper 'development' lengths: i.e., debonding of the strips must be prevented. An FRP fabric anchor is recommended at each end of the tension strips to prevent premature debonding at the ends of the beam (Figure 1).

For shear retrofit, sheets of FRP are bonded to the exterior of the web and run transverse to the member axis. Similar requirements regarding anchorage of the FRP sheets must be considered as are required for steel stirrups. This typically means that the shear reinforcement must be continuous around the tension side of the member and be properly embedded in the compression zone. Two alternatives for FRP shear strengthening of AASHTO-type girders are shown in Figure 2. Ideally, closed stirrups of FRP are created as shown in Figure 2a. Because of the tendency of the FRP at the reentrant corner to pull away from the concrete surface, it is necessary to provide a physical restraint such as an angle with thru-bolts.

The top of the stirrups requires breaking slots through the top slab of the bridge, with the associated disruption to traffic. If this is not possible, the stirrups or FRP sheets can be anchored at the soffit of the top slab as shown in Figure 2b.

Guidelines are currently being developed for the design of FRP systems. One example is the ACI 440R-02 report published in August 2002. As the design strategy is similar to that used for steel reinforcement, the basic concepts and procedures should be familiar to designers. One should note, however, that these are relatively new materials, and that the design process is not as mature and based on as much experience as is the case for traditional reinforced concrete.

Details on this study can be found in the technical report *A Primer for FRP Strengthening of Structurally Deficient Bridges* submitted to the Hawaii Department of Transportation (HDOT) and available as research report UHM/CE/02-03 at www.eng.hawaii.edu/CE/research0.html. This study was funded by the HDOT Research Board under Project No. HWY-L-2001-01, *Use of Advanced Composites for Hawaii Bridges with Application to Renovation of Historic Bridges*. Mr. Paul Santo, HDOT Bridge Design Engineer, is the technical contact. This support is gratefully acknowledged.

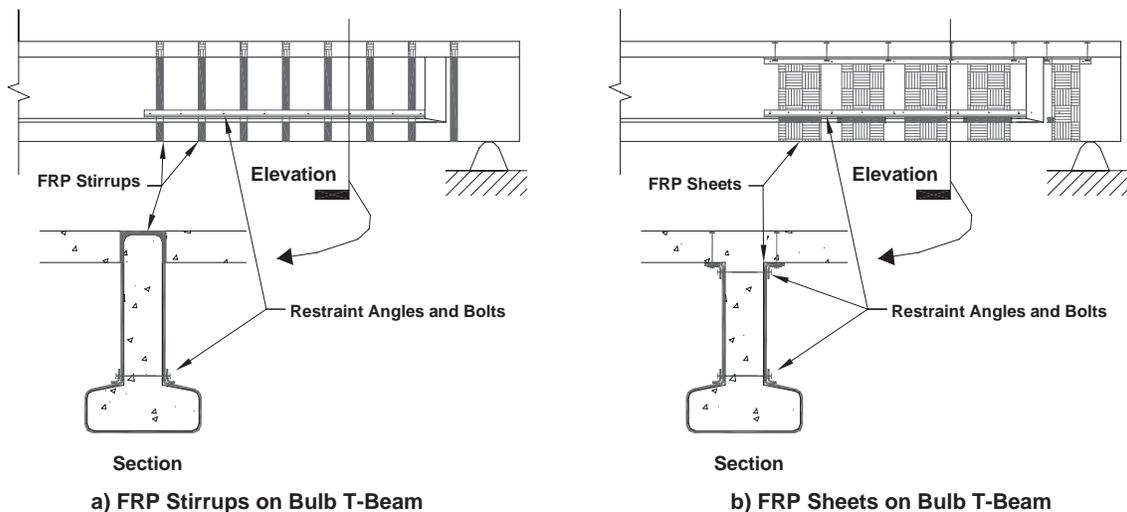


Figure 2: Typical shear strengthening of AASHTO-type girder bridge



FOURTH QUARTER WORKSHOP SUMMARY

By Matthew Alonzo, Hawaii LTAP

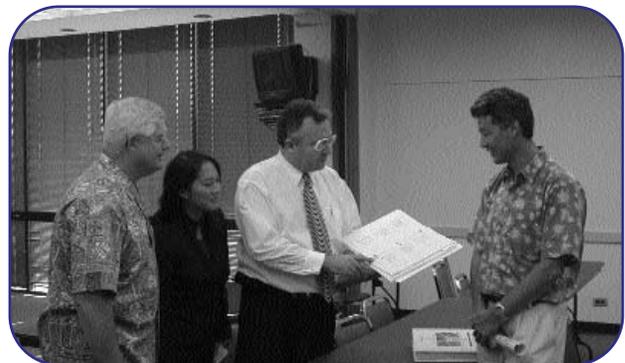
After a loaded and exciting third quarter, Hawaii LTAP and its partners continue its outstanding service to the transportation community. Kicking off the fourth quarter was the annual **Superintendent/Overseer Conference** held at Kauai. Refer to cover page for highlights.

The **Countermeasure Design for Bridge Scour and Stream Instability** course provided solutions to highway related failures from the effects of stream instability, scour, erosion and stream aggradations and degradation problems. The Hydraulic Engineering Circular (HEC), "Bridge Scour and Stream Instability Countermeasure - Experience, Selection, and Design Guidance" (HEC-23) was the design manual for this course. Dr. Peter Lagasse of Ayres Associates and Dr. Larry Arneson of the Federal Highway Administration (FHWA) instructed this 3-day workshop.

The **Engaging Stakeholders in Your Project** workshop sponsored by the American Public Works Association (APWA), American Society of Civil Engineers (ASCE) and Hawaii LTAP gathered experts to speak about dealing with stakeholders. Understanding the stakeholders, strategies, developing excellent communication skills and managing conflict are key aspects in public relations. Big Island Mayor Harry Kim was a special guest and speaker at this workshop. With 24-years serving the Hawaii County as the Civil Defense Administrator, he developed and mastered skills in emergency response to disasters. His stories and experience touched and inspired workshop participants. Serving as Big Island's Mayor, Harry is the epitome of the public servant with invaluable skills in public relations.

The main goal of **Asset Management Systems (AMS)** is to obtain optimum return on the public's investment. Managing assets accomplish this

with up-to-date information on facilities conditions and performance. AMS save time and provide accurate information that helps managers make confident decisions on selective maintenance programs. Participants were presented tried and true techniques for developing AMS and initiating proactive maintenance programs. Also presented was the Governmental Accounting Standards Board (GASB) statement 34. It consists of new accounting standards that will affect state and local governments. The workshop also helped participants understand how to choose AMS software and how to maintain their AMS to help extend the performance of their infrastructure at the lowest costs. Charles J. Nemmers, P.E. and Dr. Ali Roohanirad conducted this 2-day workshop.



Asset Management workshop

The **2002 Highways Division Construction Meeting** was the first meeting held entirely for the Highways Division. Similar to the Superintendent/Overseer conference, this conference provided representatives from each Highway section the opportunity to participate in peer exchange and in sharing experiences and knowledge.

Wrapping up the fourth quarter was the **Pre-Conference Meeting** for the 2003 National LTAP/TTAP Conference at the Sheraton Wakiki. Refer to page 3 for highlights.

Superintendent/Overseer Conference *(Continued from page 1)*

Stanley Nakasone of the Hawaii County Hamakua District was very interested in Maui's inventions and saw that these ideas improve equipment design and create less costly methods of completing the job.

2002 Award Winning Mousetrap



WEEPHOLE CLEANER

Edwin Bonnell
Lahaina, Maui

The conference shared and offered solutions to problems such as structural failures in catch basin design, shoulder improvements, drainage, debris removal and man and equipment power shortage, to name a few. The Corps of Engineers discussed inspections of flood control channels and their rating system. The Big Island's presentation was on road widening and the equipment they invented with specifications and video. Leonard Costa stated, "it was their presentation" at the conference. The city and county of Honolulu presented a Geographic Information System (GIS) featuring the use of palm computers to map locations of culverts, manholes, roads and other utilities.

As host of the third annual conference, Kauai led the conference on a few field excursions to the Koke'e Tracking Station, Waimea Canyon, the Kauai Solid Waste Station, a levee and a Hindu Monastery.

The conference was a success. All participants of this conference were willing to share and contribute positive feedback to others' concerns. Saburo Goldsteen from Oahu responded to a problem with catch basin lips described by Eddie Emoto and had a solution. On the Monday morning following the conference, Eddie received a fax with a detailed sketch of the solution.

Hawaii LTAP would like to thank all the counties for making the conference a success. We also encourage new "better mousetrap" inventions to be submitted for publication in a future newsletter.

Note: This article was compiled by participants feedback.



For upcoming workshops and past newsletters, visit our webpage at:
www.eng.hawaii.edu/~hltap

Director's Note

by C.S. Papacostas

I'd like to thank all of you who took the time to complete our workshop request form. With feedback from our advisory committee, we are in the process of ranking the suggested topics to help us in formulating next year's training and technology transfer agenda.

The City & County of Honolulu will host the fourth annual superintendent/overseer conference. Plans are afoot to again present the LTAP "better mousetrap" awards. We encourage you to submit your entries for next year's contest. Any device or machine/equipment modification that has improved your organization's efficiency would be eligible.

Next year will also mark the reauthorization by the U.S. Congress of the transportation bill. According to the Federal Highway Administration, the President is expected to submit the reauthorization bill to the Hill in early 2003. The new bill is anticipated to cover a six-year period as its immediate predecessors, ISTEA and TEA-21. All indications are that the Administration's priorities would be safety, intelligent systems, innovative financing, system management and funding flexibility.

Continued federal funding of the LTAP program would be included in the new bill. I am happy to tell you that several national organizations, including the American Association of State Highway and Transportation Officials (AASHTO) and the American Public Works Association (APWA), have provided favorable testimony to the Administration.

I look forward to the renewal and enhancement of the LTAP program and the opportunity to continue supporting your technology transfer needs.

Happy New Year!

Program Manager's Note

by Juli Kobayashi

Happy Holidays!! Wow, it's that time of year again and it has gone by so quickly. We really had a busy year with 24 workshops that trained over 1,600 participants. Some of the highlights of the year were the Designing Streets for Pedestrians & Bicyclist workshop, the NPDES Stormwater Training Course, the 2002 National LTAP-TTAP Conference in Vermont and the Pre-Conference Planning Meeting just to mention a few.

The Designing Streets for Pedestrians and Bicyclist workshop was so popular that we had to sponsor a second set of training. There were a lot of positive comments from the participants.

The NPDES Stormwater Training courses were held in June with over 664 participants. This course was co-sponsored by the DOT and the instructors went to each county to train County and DOT personnel.

The 2002 National LTAP-TTAP Conference in Vermont was very beneficial in helping us plan the conference next year. We "shadowed" the Vermont staff and gained valuable conference experience. The hula that we performed even got a standing ovation!

The Pre-Conference Planning Meeting for the 2003 National LTAP-TTAP Conference was a big success. We got most of the agenda planned and also showed our appreciation by giving them an island tour. We would like to thank everyone that has shown us so much encouragement and support.

Finally, we appreciate your enthusiasm in requesting workshops and will try to accommodate as many requests as we can.

Have a wonderful Christmas!

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Have a safe and joyful Holiday Season!

Hawaii LTAP Transportation Library

The Hawaii Local Technical Assistance Program Library is located in Holmes 207A at the University of Hawaii. The library houses over 10,000 transportation-related technical reference materials. Informational and workshop videos may also be found in the library. Reference materials and videos are available to the public and may be borrowed or copied.

Database of all materials may be found on the web at:

Videos –

www.eng.hawaii.edu/~hltap/video.html

Publications –

www.eng.hawaii.edu/~tlib

Website:

<http://www.eng.hawaii.edu/~hltap/>

For more information, please contact Juli Kobayashi at 956-9006.

Mele Kalikimaka



Hau'oli Makahiki Hou!



Free Publications

1. **Basic Guide for GASB 34 - Phase III Local Governments** (Booklet)
2. **Basic Guide for GASB 34 - Phase III Local Governments** (Compact Disk)

For free copies (while supplies last) please call (808) 956-9006.



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The Hawaii Local Technical Assistance Program (LTAP) is a cooperative program of the University of Hawaii Department of Civil and Environmental Engineering, the Hawaii Department of Transportation, Highway Division, State of Hawaii and the U.S. Department of Transportation Federal Highway Administration, Hawaii. The LTAP program provides technical assistance and training programs to local transportation related agencies and companies in order to assist these organizations in providing cost-effective improvements for the nation's highways, roads and bridges. Our office is located at:

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The contents of this newsletter do not necessarily reflect the official views or policies of the HDOT, FHWA or the University of Hawaii. The newsletter is intended to convey useful information to the local highway and transportation personnel. Any references to commercial products or organizations are included only for informational purposes and are not intended as endorsements by the Hawaii LTAP.

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