HAWAIIAN CONNECTIONS

THE HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

VOLUME 7, No. 1 SPRING 2005

IN THIS ISSUE

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

ENGINEERING EXPO 2005

By Dr. Song K. Choi, University of Hawaii College of Engineering

Imagine over 700 high school students and teachers… Throw in seven engineering competitions, five engineering lab tours & demonstrations, 130+ volunteers, and what do you get? You get the Annual University of Hawaii's College of Engineering's Engineering Expo 2005, an excitement-driven atmosphere of challenges, imagination, creativity, and good clean fun, well most of it....

Bottle Rocket Competition.

Dropping an egg tucked inside a structure from the 2nd and 4th floors of a building may not be the cleanest of events, but it definitely created a lot of excitement. The Egg Drop Competition, sponsored by the American Council of Engineering Companies of Hawaii (ACECH, Hawaii chapter), was one of seven engineering games that high school students had the opportunity to compete in at the Expo. Other events included the Bottle Rocket Competition, sponsored by the American Society of Mechanical Engineers (ASME, student chapter), which tested students' abilities to design and manufacture a simple water rocket to remain in the air for the longest possible time; the Model Paper Column Competition, sponsored by the Chi Epsilon (XE, student honor society), which challenged students' abilities to design, build, and test a paper column that was judged on workmanship and efficiency; the Rubber Band Racers Competition, sponsored by the Society of Automotive Engineers (SAE, student chapter), which called for an internally powered rubber band racer to be built to race a 15-foot track in the fastest time; the Motor Building Competition, sponsored by the Institute of Electrical and Electronics Engineers (IEEE, student chapter), which tested students' ingenuity in constructing an electric motor within a 30 minute timeframe; and two new competitions including the I See, You Create Competition, sponsored by the Society of Women Engineers (SWE, student chapter), which required students to utilize teamwork and effective communication in creating an object; and finally the Battle Bots Competition, sponsored by the Pi Tau Sigma (PTS, student honor society), which tested students' skills in building a custom battle-bot (robot) that proved superior against all others.

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NATIONAL WORK ZONE AWARENESS WEEK

By John R. McCarthy, Alabama Technology Transfer Center

The sixth annual National Work Zone Awareness Week (NWZAW) will be held from April 3 to April 9 of this year. The purpose of NWZAW is to educate the nation on work-zone related injuries and fatalities. Part of this education is informing the public of the hazards and dangers that can be encountered and avoided when driving through a roadway construction zone.

Data has been gathered on work zone crashes and fatalities by the National Work Zone Safety Information Clearinghouse (NWZSIC) to improve safety in highway work zones. The Clearinghouse is a part of the Texas Transportation Institute at Texas A&M University. Information on frequencies of work zone fatalities and fatal crashes are available on the NWZSIC website for the years 1994 to 2003, as shown in the table below.

Nationwide there were 1028 persons killed in construction and utility work zones in 2003. This figure is down from the previous year when 1186 persons were killed. However, it is noted that nationwide the number of work zone fatalities each year from 1999-2003 is higher than each year from 1994-1998. That is, the average number of deaths nationwide has increased from 760 per year to 1020 per year, based on these five-year analysis periods. Thus, the average number of work zone fatalities has increased 34 per cent in these five-year periods.

Another way to express these national figures is to note that from 1994-1998, a work zone fatality occurred once every 11.5 hours, while from 1999-2003, a work zone fatality occurred once every 8.6 hours.

Year	Number of Fatalities	Number of Fatal Crashes
1994	828	721
1995	789	665
1996	717	635
1997	693	594
1998	772	681
1999	872	772
2000	1026	966
2001	989	877
2002	1186	1035
2003	1028	919

National Fatality Data

The data is also presented by state. In Alabama, a similar trend can be seen where the last five years appear to be more severe than the previous five years. State specific frequency data can also be obtained from the NWZSIC website at:

< http://wzsafety.tamu.edu/crash_data/fatal.stm >

To reverse this trend, a continued effort is needed to improve the safety of work zones. To respond to this need, the Alabama Technology Transfer Center has joined with the efforts of the other 56 Local Technical Assistance Program centers across the country to improve work zone awareness. Promoting National Work Zone Awareness Week is one step in this effort. Continued training on the standards and methods of traffic control through construction and maintenance work zones will be another part of this effort. This training is based on the standards and guidelines presented in the Manual on Uniform Traffic Control Devices (MUTCD).

The use of frequencies for this data does not take into account any increase in the lane miles of work zone activities or any increase in traffic volumes. Further research is needed to investigate the effect of these exposure variables.

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NATIONAL WORK ZONE AWARENESS WEEK

(Continued from page 2)

Information on worker injuries has been researched by the National Institute for Occupational Safety and Health (NIOSH). In the summary report of a past NIOSH workshop, injury prevention measures were noted as being the careful review of a traffic control plan and revising the Occupational Health and Safety Administration regulations to require adherence to the MUTCD. Data collection systems for non-fatal occupational injuries were also noted as providing insufficient detail to estimate the number of workers injured in work zones nationally. Better data collection to distinguish between injuries to motorists and injuries to workers was also recommended in the report.

To educate motorists about the hazards and dangers of work zones, the Federal Highway Administration has developed fact sheets about work zones. These sheets emphasize points such as:

- Work zone activity is significant
- Work zones cause delay
- There are more work zones in the summer
- Motorists are growing more frustrated
- Vehicle miles of travel grew at a greater rate than miles of roadway
- More work is being done on existing roads already carrying much traffic
- Night work is increasing as agencies try to manage work zone delays
- Work zone mobility and safety are linked

Further details about each of these points is available at the FHWA website:

<http://www.ops.fhwa.dot.gov/wz/resources/facts_stats.htm >

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 Hawaiian Connections.

Your Name and Phone Number:

_____

Inventor's name and phone:

_____

Invention:

_____

Please fax this form to (808) 956-8851.

NEWS FROM OUR PARTNERS...

Cement and Concrete Products Industry

By Wayne Kawano, CCPI of Hawaii

CCPI Welcomes the opportunity to be part of the Inaugural 2005 Masonry & Concrete Expo of the Pacific. Honolulu will be holding a three-day Masonry & Concrete show comprised of technical sessions and a two-day Expo from June 23-25, 2005. This event is expected to draw attendees from Hawaii and the Pacific Rim. The event offers an invaluable opportunity for networking with professionals from the U.S. and around the globe.

The Expo's conference theme is "Kapili I Na Pohaku Pa'a" "Build/Mend/Repair/Stone Solid."

Title sponsors for this inaugural Expo are: First Hawaiian Bank and the Hawai`i Masons & Plasterers Fraternal Association, co-sponsored by HONBLUE.

The Hawai`i Convention Center will be the site of the first building and construction show focused on masonry & concrete construction. This would include the mason, cement finishing, plastering and ceramic tile/stone trades and construction and its affiliates.

The focus of the Expo is to increase the knowledge and awareness of the masonary and concrete trades and materials; to expand the network of the industry contracts; and to offer opportunities to interact with potential buyers and professionals.

Target attendees to the Expo would include: Design Professionals; Engineers; Contractors; Government Agencies; Property Managers; Craft Workers; Retail/Suppliers; and Building Professional/Consultants.

Admission to the exhibits and mini-workshops is free. There will be a registration fee for special seminars. For additional information please contact CCPI @ 848-7100 or wkawano@ccpihawaii.org.

Hawaii Asphalt Paving Industry

By Keith Takekawa, HAPI President

The National Asphalt Pavement Association (NAPA) held its 50th Anniversary Annual Convention, titled "Pavement Paradise" at the beautiful Hilton Waikoloa Village on the Big Island. Imagine the huge Grand Ballroom, full of Asphalt Paving Company representatives from across the United States (45 States + District of Columbia) plus 9 other Countries, all gathered together to celebrate the past 50 years of NAPA and learn more about what's in store for the future of the Hot Mix Asphalt (HMA) Industry. The NAPA Convention featured a week long of educational workshops with topics such as 'Paving a Well-Funded Highway Program'; 'Road Construction Simulator'; & 'Perpetual Pavements' to name just a few. Local HAPI Members that attended came away very energized and hopeful that the HMA Industry is ready to meet the challenges of the next 50 years and beyond.

With the local news and new Mayor of the City & County of Honolulu focused on the poor conditions of the roads and getting back on track with road repairs and resurfacing of streets, the next training session should be very timely and appropriate. Scheduled for May 4th & 5th, 2005 is the fourth session in HAPI's training series, titled HMA Pavement Structural Design. Local boy, **Steve Muench**, turned Assistant Professor at the University of Washington's Civil & Environmental Engineering will do the honors of instructing this very technical session. Steve has a knack of making the subject matter very understandable for all. Be ready to bring your laptops this time!

Also, Hawaii Asphalt Paving Industry (HAPI) and the Cement & Concrete Products Industry (CCPI) will once again team up and co-sponsor the **Steve Fong** Scholarship Golf Tournament. This will be the 3rd year for this event that proceeds from this Scholarship Golf Tournament will be used to benefit (a year's tuition for) an undergraduate student enrolled in the Civil and Environmental Engineering program at the university of Hawaii, Manoa Campus. This years event will be held on Thursday, August 18th, 2005 at the Pearl Country Club. Mark your calendars! Entry forms will be available from April 2005.

Pave It To Save It!!!

ENGINEERING EXPO 2005 (Continued from page 1)

Twenty-one Hawaii high schools, which included four from the neighbor islands, were represented at the Expo. The following is a list of the winners for each of the competitions:

Battle Bots
1st: Farrington High School
2nd: Kamehameha Schools
3rd: Farrington High School

Bottle Rocket
1st: Farrington High School
2nd: McKinley High School
3rd: Kaimuki High School

Egg Drop
1st: Mililani High School
2nd: Farrington High School
3rd: Maui High School

Model Paper Column
1st: McKinley High School
2nd: Hawaiian Mission Academy
3rd: Kauai High School

Rubber Band Racers
1st: Maui High School
2nd: Mililani High School
3rd: McKinley High School

I See, You Create
1st: Kamehameha Schools
2nd: Nanakuli High School
3rd: Roosevelt High School

Motor Building
1st: Mililani High School
2nd: Kamehameha Schools
3rd: Kamehameha Schools

As an annual event, the Engineering Expo strives to introduce high school students to real-life hands-on activities that help exemplify the field of engineering. With the support and dedication of the professional engineering associations, and the College of Engineering faculty, staff, and students, the Engineering Expo hopes to continue this annual tradition of igniting sparks of interest in the engineering field to high school as well as establishing the Junior Expo for middle school students in the fall of 2005. For additional information on participation or sponsorship in future events, please contact **Ms. Laura Shimabukuro**, CoE Student Services Coordinator or **Dr. Song K. Choi**, Assistant Dean, at 808-956-8404 or e-mail to expo@eng.hawaii.edu.

Motor Building

Rubber Band Racers

HAWAII DOT RESEARCH PROGRAM

The following research project final reports were sent to the libraries and research agencies the HDOT distribution list during the period of May 2004 to March 2005. A copy of each report is in the LTAP library.

"Hawaii Superpave Demonstration Project: Measurement of Asphalt Mix Design Parameters Using Image Analysis"

Principal Investigator - Associate Professor **Horst Brandes**

Objective:
Develop a digitized image analysis computer program to determine parameters such as aggregate gradation, asphalt content, and air void content of compacted asphalt mixtures.

Results:
Development of the image analysis computer program ImagePac. "The predictions are considered good." Validation tests are needed for asphalt mixtures with aggregates, asphalt contents and air void contents that differ from the asphalt mixtures used in this project.

"Use of Advanced Composites for Hawaii Bridges"

Principal Investigator - Professor **H. Ronald Riggs**

Objective:
1. Summarize information on the use of fiber reinforced polymers (FRP) for the repair of structurally deficient bridges into one document.
2. Identify a deficient bridge in Hawaii to study of the use of FRP to restore the bridge and develop a proposal to be submitted to the FHWA Innovative Bridge Research and Construction (IBRC) program.

Results:
1. A report titled "A Primer for FRP Strengthening of Structurally Deficient Bridges".
2. IBRC funded research project titled "Instrumentation and Monitoring the Performance of the FRP Shear Strengthening of the Salt Lake Boulevard Bridge".

"Test of Cracked Prestressed Concrete T-Beam Retrofitted for Shear Using CFR L Shaped Plates"

Principal Investigator - Associate Professor **Ian Robertson**

Objective:
1. Evaluate the performance of CarboShear-L shaped stirrups as a retrofit over existing shear cracks.
2. Provide guidance for the shear retrofit for the AASHTO girders in the Salt Lake Boulevard Bridge.
3. Evaluate the instrumentation system used in this study for its potential to be used in the Salt Lake Bridge shear strengthening project.

Results:
1. The CarboShear-L shear stirrups were effective in:
    a. Preventing shear failure.
    b. Controlling crack width and preventing the growth of the crack under cyclic loading.

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HAWAII DOT RESEARCH PROGRAM (Continued from page 6)

2. The strain gages effectively monitored the delamination of the stirrup.
3. When loaded to failure, failure resulted from delamination of the CorboShear strips that were bonded to the soffit of the beam.

"Investigation of Traffic Detectors for use in Hawaii"

Principal Investigator - Associate Professor **Panos Prevedouros**

Objective:
Determine which types of traffic detecting equipment to use for collecting traffic information in Hawaii.

Results:
Recommended sensors and equipment, with conditions for their application, are the SmartsSensor, SAS-1, TrafInfo, and TrafficWerks. Discussion on the installation, operation, and performance of the different types of equipment investigated in the project is provided.

"Correlation of Resistance Value (R-Value) with California Bearing Ratio (CBR) for use in Design of Flexible Pavements"

Principal Investigator - Associate Professor **Phillip Ooi**

Objective:
Develop correlations to estimate the R-value from California Bearing Ratio and other soil parameters for soils in Hawaii used as the subgrade for roadway pavements.

Results:
1. Four methods are provided to estimate R-Value from CBR.
2. A method is provided to estimate R-Value from soil parameters other than the CBR.

HIGHWAY FACTS

Licensed drivers by age for the State of Hawaii (2003)
Information from the Federal Highway Administration Office of Highway Policy Information

Sex	19 and under	20-29	30-39	40-49	50-59	60-69	70-79	80 and over	Total
Male	16,029	78,978	84,337	92,380	81,719	45,851	29,870	11,419	440,583
Female	13,498	69,594	78,692	86,182	73,023	38,784	26,263	7,569	393,605
Total	29,527	148,572	163,029	178,562	154,742	84,635	56,133	18,988	834,188

PEDESTRIAN SAFETY COUNTERMEASURE SELECTION SYSTEM COMPLETE

By Tamara Redmon, FHWA Pedestrian and Bicycle Safety Program Manager

This project (also known as "Pedsafe") was developed by the University of North Carolina Highway Safety Research Center for the Federal Highway Administration. It is an expert system product designed to assist practitioners with the selection of countermeasures to address pedestrian safety and mobility problems. It is the next generation of the FHWA report titled *Pedestrian Facilities User Guide: Providing Safety and Mobility.* The system includes several interactive tools and is designed to:

- Provide information on the countermeasures available for prevention of pedestrian crashes and/or improving motorist and pedestrian behavior.
- Highlight the purpose, considerations and cost estimates associated with each countermea sure.
- Provide a decision process to select the most applicable countermeasures for a specific location.
- Provide links to case studies showing the various treatments and programs implemented in communities around the country.
- Provide easy access to resources such as sta tistics, implementation guidance, and reference materials.

The tools available in PEDSAFE are designed to enable practitioners to effectively select and review engineering, education, or enforcement treatments to mitigate a known crash problem or change motorist and/or pedestrian behaviors:

Selection Tool - Allows the user to develop a list of possible countermeasures on the basis of site characteristics, such as geometric features and operating conditions, and the type of safety problem or desired behavioral change. The decision logic used to determine when specific treatments are and are not applicable was based on input from an expert panel of practitioners.

Interactive Matrices - Shows the relationship between the countermeasures and the performance objectives or crash types and can be used to display applicable countermeasures.

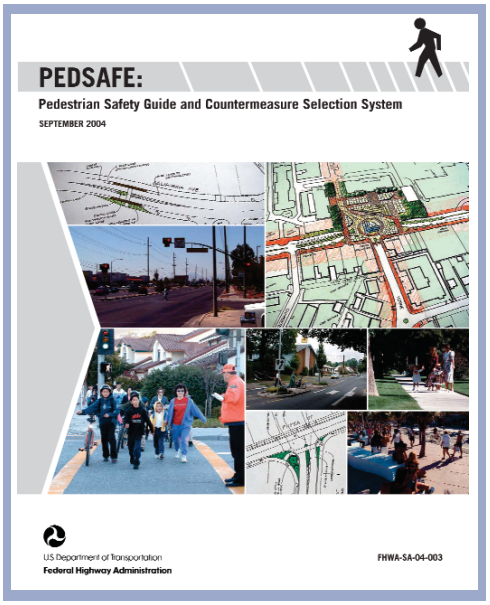
Countermeasures - Details of 49 engineering, education and enforcement treatments or programs for improving pedestrian safety and/or mobility are provided in the categories of pedestrian facility design, roadway design, intersection design, traffic calming, traffic management, signals and signs, and other measures.

Case Studies - More than 70 real-world examples illustrate various treatments and/or programs as implemented in a state or municipality.

Pedsafe is available at:
www.walkinginfo.org/pedsafe

For hard copies or more information, order here:
http://safety.fhwa.dot.gov/ped_bike/walk/order/order3.htm

For more information contact **Tamara Redmon** at tamara.redmon@fhwa.dot.gov or 202-366-4077.



FREE PUBLICATIONS

1. **FHWA-RD-90-034** - Research and Development Program for Highway Construction Engineering Management
2. **FHWA-RD-93-035** - Repair of Process-Related Defects in Electroslag Welding
3. **FHWA-RD-87-001** - Investigation of Asphalt Additives
4. **FHWA-RD-87-042** - Methodology of Road Roughness Profiling and Rut Depth Measurement
5. **FHWA-RD-87-061** - Variable Amplitude Load Fatigue Task A - Literature Review
6. **FHWA-RD-88-069** - Pavement Friction Measurement Normalized for Operational, Seasonal, Weather Effects
7. **FHWA-RD-88-145** - Conductive Overlay in Conjunction with an Active Cathodic Protection System
8. **FHWA-RD-89-043** - Reinforced Soil Structures Volume I
9. **FHWA-RD-89-084** - Instrumentation for Flexible Pavements--Field Performance of Selected Sensors, Vol. I: Final Report
10. **FHWA-RD-89-110** - Development of Procedures for the Calibration of Profilographs
11. **FHWA-RD-89-136** - Performance of Jointed Concrete Pavements, Vol. I: Evaluation of Concrete Pavement Performance and Design Features
12. **FHWA-RD-89-137** - Performance of Jointed Concrete Pavements, Vol. II: Evaluation and Modification of Concrete Pavement Design and Analysis Models
13. **FHWA-RD-89-138** - Performance of Jointed Concrete Pavements, Vol. III: Summary of Research Findings
14. **FHWA-RD-89-139** - Performance of Jointed Concrete Pavements, Vol. IV: Appendix A - Project Summary Reports and Summary Tables
15. **FHWA-RD-89-140** - Performance of Jointed Concrete Pavements, Vol. V: Appendix B - Data Collection and Analysis Procedures
16. **FHWA-RD-89-141** - Performance of Jointed Concrete Pavements, Vol. VI: Appendix C - Synthesis of Concrete Pavement Design Methods and Analysis Models
17. **FHWA-RD-89-142** - Structural Overlay Strategies for Jointed Concrete Pavements, Vol. I: Sawing and Sealing of Joints in AC Overlays of Concrete Pavements
18. **FHWA-RD-89-143** - Structural Overlay Strategies for Jointed Concrete Pavements, Vol. II: Cracking and Seating of Concrete Slabs Prior to AC Overlay
19. **FHWA-RD-89-144** - Structural Overlay Strategies for Jointed Concrete Pavements, Vol. III: Performance Evaluation and Analysis of Thin Bonded Concrete Overlays
20. **FHWA-RD-89-145** - Structural Overlay Strategies for Jointed Concrete Pavements, Vol. V: Summary of Research Findings

We are cleaning and reorganizing the Transportation Library! Please take the time to review this list. Any remaining copies will be discarded by JUNE 30, 2005.

Hawaii LTAP Transportation Library

The Hawaii Local Technical Assistance Program Library is located in Holmes 143A 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 us at 956-8719.

Director's Note

by C.S. Papacostas

The latest national LTAP strategic plan specifies four program focus areas, that is, safety, workforce development, infrastructure management and value delivery. Specifically it states that:

- *Safety is a primary concern of every part of the surface transportation system, with focus from local, tribal, state and Federal government partners as well as the private and commercial sector.*

- *The LTAP/TTAP Centers are located in academic institutions as well as State DOTs, linking us to both the pipeline into the transportation workforce as well as the white- and blue-collar workforce already in that pipeline. As educators and information sharers, the program is an important cog in the Workforce Development cycle; as the transportation sector struggles to attract, retain and retrain present and future workers, this promises to remain a relevant focus area for the foreseeable future.*

- *Infrastructure Management gets at the heart of the local and tribal agency situation - developing strategies that maximize the performance of their infrastructure while minimizing any negative effects on financial and human resources.*

- *Finally, Value Delivery is central to our program. The ability to efficiently transfer technology and information through courses and relationships to our partners and customers - whether they are local or tribal governments, state DOTs, or private concerns - is the primary measure of success and can lead to numerous general and distinct performance measures.*

I'd like to emphasize, however, that your training requests need not be restricted to these four areas. Each center is free to address other local concerns as well.

Program Manager's Note

by Juli Kobayashi

This January I attended the Transportation Research Board Meeting in Washington D.C. While there, I attended the National LTAP Meeting and received valuable information on some of the strategic changes that are occurring within the program. I was also able to attend several sessions on training and technology transfer. There are valuable services offered by FHWA and other LTAP programs that provide a network of resources available.

In between the meeting sessions, I was able to attend the Hawaii Major State Day at the Washington National Cathedral and had the honor of meeting ***Senator Daniel Inouye****. This special service is held for each state during a particular week every year. The service started with Native Hawaiian chants and prayers and* ***Senator Inouye*** *read scripture from the Bible. The attendees from Hawaii had a special section reserved for them and were presented with ti leaf leis. After the service, I had the opportunity to speak to* ***Senator Inouye*** *and tell him about the Hawaii LTAP Program and what we are doing for the State of Hawaii. It was an honor and a privilege to meet him.*

This first quarter, we held six workshops with a total of 361 participants. For more details on these workshops, please read "Hawaii LTAP Activities" on page 11. We look forward to hearing from you and your requests for valuable workshops as we make plans for the rest of the year.

In between our busy workshop schedule, we moved to a new/old office in Holmes Hall. Since the University's Facility Department is currently busy with the flood damage, we had to repair the office before we moved in. This experience gave us new skills in patching and painting and other minor construction skills. A real eye opener for those of us that have never done that kind of work before ☺. We would like to welcome anyone interested in visiting our new home…Holmes Hall 246.

*Hawaiian Connections features scenic pictures from various locations in Hawaii.

In this issue, we are featuring the island of Oahu. The official flower of Oahu is the yellow Ilima (See left). On the cover is the view of **Waikiki** from atop Diamond Head and on the back is the **Makapu'u Lighthouse**, located on the Windward side of Oahu.

HAWAII LTAP ACTIVITIES

Compiled by Gail Ikeda, Hawaii LTAP

2005 began with a cooperative workshop one year in the making. With three of our partners, the American Council of Engineering Companies (ACEC), American Public Works Association (APWA), American Society of Civil Engineers (ASCE), we offered a 2-day workshop entitled, "Design-Build Projects: Benefits and Pitfalls." The first day consisted of a Design-Build overview by **Eugene Wright** of the University of Nebraska. He compared design-build to other methods such as the design-bid-build approach. Following the overview was a panel discussion with the local experience of the owner's perspective. Panelists included representatives from the U.S. Navy, Hawaii Department of Transportation and the City & County of Honolulu. The owners went over design-build procurement procedures, preparation of RFQ's and RFP's, how design-build teams are selected and outcomes. During lunch, **Jiro Sumada** of W.H. Shipman captivated the attendees with an animated presentation on team-building. After Jiro's inspirational talk on team-building the audience focused their attention on panelists from Dick Pacific, Kiewitt Pacific, Earth Tech, Kauahikaua & Chun/Architects and Finance Insurance. They discussed the design-build team's perspective on responding to RFQ's & RFP's, risks and rewards to participate on design-build projects, contracting & subcontracting issues, insurance, liability & risk concerns and cost versus quality decisions. The first day ended with a lively exchange involving both panels and responses to questions from the audience. The second day focused on key issues in the design-build process. **Eugene Wright** was joined by Attorney **Anna Oshiro** (of Damon Key Leong Kupchak Hastert) to discuss project delivery systems, contracts, bridging, payment of stipends and design build experiences in the public sector.

In February, we worked with the Oahu Metropolitan Planning Organization (OMPO) and the National Transit Institute (NTI) to bring the "Multimodal Travel Forecasting" workshop to Honolulu. There were two sessions held. The first was a 1-day overview intended for students, administrators and decision-makers. This overview consisted of identifying the information provided in a travel forecast, discussing the usefulness of this information in the evaluation of transportation issues and demonstrating various ways of getting the information into formats helpful to transportation professionals, local officials and the general public. The second session was a 3-day workshop designed for technical staff responsible for travel forecasting in local, regional and state transportation agencies and their managers. In the three days participants covered various topics such as: measures of user benefits, representation of travel markets, characteristics of travel choices and traveler responses, quality control, model structures and interactions and tour-based models and transims.

Also in the month of February in cooperation with the Hawaii Asphalt Paving Industry (HAPI), we invited **Dr. Dave Timm** to train participants in a "Perpetual Pavement Design Seminar". The hands-on training course for the design of perpetual, or long-life, asphalt pavements featured the design software, PerRoad 2.4 developed by **Dr. Timm** at the National Center for Asphalt Technology. The course also focused on mechanistic-empirical pavement design concepts as applied to long-life pavement design.

We finished the first quarter with the "Best Practices in Design & Construction of Concrete Pavements" workshop in conjunction with the Cement and Concrete Products Industry of Hawaii (CCPI). **Dr. Michael Ayers** educated the participants with topics on: pavement types and design features, Portland Cement Association pavement design method, AASHTO 1993 pavement design procedure, introduction to mechanistic-empirical design method, concrete mix characterization, jointing design and layout for streets and highways, Ultra-Thin Whitetopping and design and construction of subgrades and subbases.

For more information on any of these workshops, please contact us at (808) 956-9006.

HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

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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Website:
http://www.eng.hawaii.edu/~hltap/

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