

# HAWAIIAN CONNECTIONS

THE HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

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

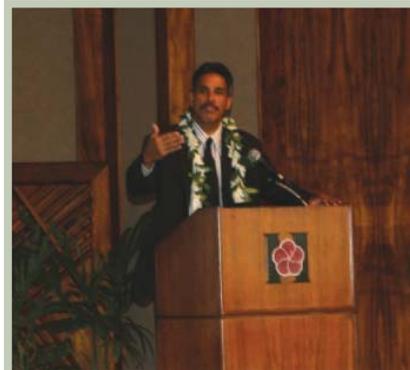
## HAWAII'S STRATEGIC HIGHWAY SAFETY PLAN

By Brennon T. Morioka, Sean Hiraoka and Gordon Hong, HDOT

The State of Hawaii Department of Transportation (HDOT), in partnership with other government agencies and private stakeholders from around the State, is in the process of developing the Hawaii's first multi-disciplinary Strategic Highway Safety Plan (SHSP). HDOT wants all of Hawaii's road users, whether driving, walking, or riding a bike, to arrive safely at their destinations. To achieve this, Hawaii's SHSP will follow the highly successful model developed by the American Association of State Highway and Transportation Officials' (AASHTO) that emphasizes a collaborative approach to addressing safety, through the 5Es (Engineering, Education, Enforcement, Emergency Medical Services, and, most importantly, Everybody else).

Led by HDOT's **Sean Hiraoka** of the Traffic Safety Section and **Gordon Hong** of the Highway Safety Office, a core planning committee is developing the plan. The core committee also includes dedicated safety partners from the Federal

Highway Administration (FHWA), Federal Motor Carrier Safety Administration, State Department of Health (DOH), County Police Departments, Honolulu Department of Transportation Services, County Prosecutors Office, Oahu Metropolitan Planning Organization, and several private stakeholders.



Lieutenant Governor **James "Duke" Aiona, Jr.**, welcomes attendees to the SHSP Kickoff Summit.

HDOT hosted a Kickoff Summit at the Honolulu Country Club on January 10, 2007, to introduce the SHSP. The summit was attended by more than 150 Federal, State, County and private safety partners. Featured speakers included Lieutenant Governor **James "Duke" Aiona, Jr.**, HDOT Interim Director **Barry Fukunaga**, **William Kootsi-**

**kas** from the National Highway Traffic Safety Administration, **Rudy Umbs** from FHWA, **Victor Casados** from Mothers against Drunk Driving and **Scott Ishikawa** from HDOT. **Dan Galanis** of DOH, and **Scott Haneberg** and **Sean Hiraoka** of HDOT also provided presentations. A

(Continued on Page 5)

# TESTING CAPABILITIES ENGINEERING

By A. Ricardo Archilla, University of Hawaii at Manoa

**A**s a result of the involvement of some of its faculty members on several research projects related directly or indirectly to Pavement Engineering, the UH Department of Civil and Environmental Engineering (CEE) has been enhancing the facilities for research in this area. The existing facilities for concrete testing in the material laboratory and for soils and aggregate testing in the geotechnical engineering laboratory are now complemented by several new pieces of equipment in the pavement engineering laboratory (PEL).

The equipment includes:

- **Simple Performance Tester (SPT):** This equipment allows the determination of parameters that are essential for the application of Mechanistic-Empirical design approaches for pavement design such as the Dynamic Modulus (DM) and permanent deformation characteristics of asphalt concrete mixes. The DM is needed to construct Master Curves (that allow the determination of the asphalt concrete modulus at any temperature and frequency of loading) used in the pavement response models to compute stresses and strains within the pavement structure. Asphalt concrete permanent deformation curves provide the link between pavement strains and the accumulation of pavement deformation (rutting) in the asphalt concrete mixtures.
- **Beam Fatigue Apparatus (BFA):** The BFA will allow the calibration of fatigue curves for the local of asphalt concrete mixtures. These curves provide the link

between pavement strains and fatigue development in the pavement structure. Specimens are prepared in a specially configured steel mold.

- **Universal Testing Machine (UTM 25),** a 25 kN Loading Frame and the associated Computer Data Acquisition System (CDAS). This frame allows the determination of several parameter of interest when used in conjunction with the following additional pieces of equipment and the appropriate Linear Variable Differential Transducers (LVDTs) connected to the CDAS:
  - o **6" Triaxial Cell:** The frame and the cell are being used to determine the resilient modulus characteristic of granular materials with specimen sizes of 6"x12". The resilient modulus of unbound materials is another fundamental parameter for the application of mechanistic-empirical procedures. Until the frame and cell were purchased, only 4"x8" size specimens could be tested in the CEE labs, which limited the application mostly to fine grained soils. There was a need to test more coarse grained materials (such as those used in bases) and in particular candidates for permeable base materials. In addition, this equipment allows the determination of permanent deformation curves for unbound materials. Specimens are prepared with 6 inches split mold.
  - o **Indirect tensile testing jig:** This testing jig serves the following purposes. 1) Indirect tensile testing (IDT) of strength of asphalt concrete mixtures (used



View of the SPT (both pictures) and the BFA inside the environmental chamber and next to the CDAs.

# AT THE UH PAVEMENT LABORATORY

for example to evaluate the moisture susceptibility of asphalt mixes), and 2) IDT resilient modulus determination of AC mixes.

- o **Environmental Chamber:** an IPC environmental chamber (which houses the loading frame and can hold the beam fatigue apparatus for fatigue testing) is used for temperature control of the tests involving asphalt concrete mixes: IDT tests, fatigue tests, and dynamic modulus tests (DM can also be performed with this equipment, although it is more cumbersome than with the SPT).
- **Dynamic Shear Rheometer (Bohlin CVO100):** for determination of asphalt binder properties such as the dynamic shear modulus and phase angle and other rheological measurements,
- **Brookfield Rotational Viscometer:** for viscosity measurements.
- **Rolling Thin Film Oven:** for simulation of the short term aging to the binder at the asphalt concrete plant.
- **Superpave Gyrotory Compactor:** for mix compaction and design.
- **Ignition oven:** for determination of asphalt content of field mixes. The aggregates in the mix are then recovered for gradation analysis.
- Other miscellaneous equipment include: two ovens, complete series of 12" sieves, 6 inches permeameter for granular materials, water pump circulator and heater, 22,000 g scale, vacuum pump, de-aerator, infrared and stem thermometers, a portable falling weight deflectometer, and other smaller items.

The pieces of equipment described above have added the capability to perform the tests required for mechanist-

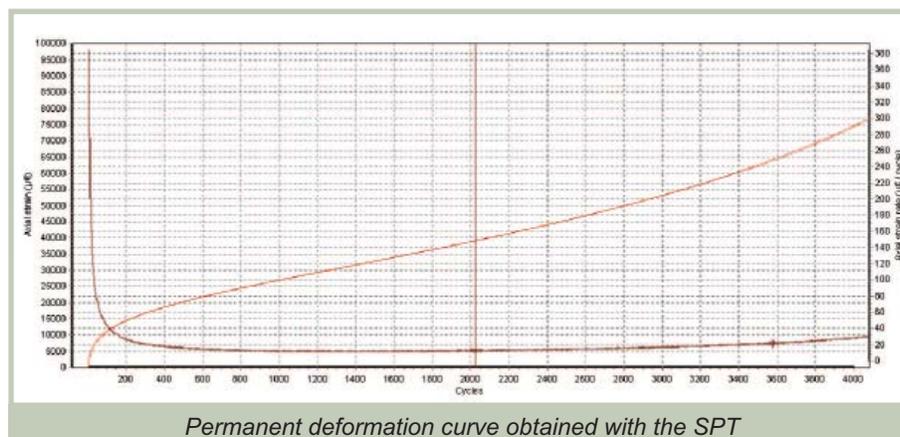
empirical analysis of flexible pavement structures.

Of the more than \$300,000 cost of the equipment, about 60% has been funded by the Federal Highway Administration and the Hawaii Department of Transportation to perform the following on-going research projects:

- "Updating of the State Pavement Management System and Calibration of the 2002 Design Guide for Hawaiian Conditions", **Adrian Ricardo Archilla** (P.I.) and **Phillip K. Ooi** (Co-P.I.).
- "Effect of Polymer Modified Asphalt Binders on the Performance of the Asphalt Concrete Mixes Used in Hawaii", funded by Federal Highway Administration and the Hawaii State DOT, **Adrian Ricardo Archilla** (P. I.)
- "Application of Recycled Materials in Highway Projects", **Phillip K. Ooi** (P.I.) and **Adrian Ricardo Archilla** (Co-P.I.)

The rest of the funding for the equipment was provided by the UH Chancellor's (~8%) office, the UH College of Engineering Dean's office (~8%) and the Department of Civil and Environmental Engineering (~24%).

As part of the first research project listed above, we are trying to characterize the local materials in terms of dynamic modulus, permanent deformation, fatigue cracking, and resilient modulus among other things. If you or your company are interested in supplying materials so that they become part of our database, we will be happy to take them and test them (as time permits).



## NEWS FROM OUR PARTNERS...

### Cement and Concrete Products Industry of Hawaii



*By Wayne Kawano, CCPI of Hawaii President*

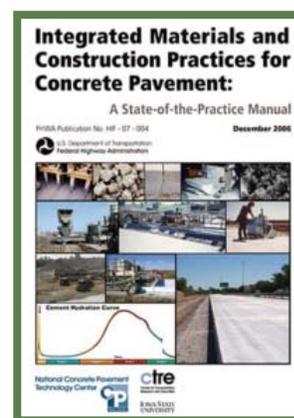
**A**loha! The Cement and Concrete Products Industry of Hawaii continues its efforts to provide the latest developments in our industry. As an active member of the American Concrete Pavement Association (ACPA) and the American Concrete Institute (ACI), we are pleased to share with you, the Integrated Materials and Construction Practices for Concrete Pavement: A State-of-the-Practice Manual.

The National Concrete Pavement Technology Center (CP Tech Center) released this comprehensive manual last month. The development of this manual was sponsored by FHWA and was a coordinated effort of the CP Tech Center, ACPA, PCA, and CTL Group.

The manual starts with a review of the basics of concrete pavement design. It provides a better understanding on the properties of concrete and the development of concrete mixes. The manual details the preparation for concrete placement, the construction process, and the quality assurance and testing programs. The information will help project and field engineers, concrete suppliers,

quality control technicians, and the construction workforce in optimizing concrete material performance in concrete paving projects.

A limited number of copies are available through CCPI or FHWA as well as downloaded through [www.cptechcenter.org/publications/imcp/](http://www.cptechcenter.org/publications/imcp/). Please contact CCPI if you have any questions on the contents on this most informative manual. Mahalo!



### Hawaii Procurement Institute

*By Jessica M. Horiuchi, Esq., Interim Executive Director*



#### SAVE THE DATE

Who: Anyone Interested in Procurement  
 What: Hawai'i Procurement Institute's 2007 Conference.  
 When: September 17-18, 2007  
 Where: University of Hawaii, East West Center  
 Why: Education and Discussion on Topics Including:

- Public/ Private Partnerships – Benefits, Risks and How It Works
- The Protest Process – Is It Effective?
- Creative Use of Contracting – Options to better meet current needs

Contact Interim Executive Director, **Jessica M. Horiuchi** at [jhoriuchi@ahfi.com](mailto:jhoriuchi@ahfi.com) with questions or to be added to HPI's mailing list.

## HAWAII'S STRATEGIC HIGHWAY SAFETY PLAN (Continued from Page 1)

meet and greet session followed the presentations, allowing participants to get to know each other better and express their expectations of the subcommittees and for the plan itself. It was clear that participants left the summit feeling inspired by the speakers and excited to contribute to Hawaii's first SHSP. A special appreciation to the Hawaii LTAP, especially **Gail Ikeda**, for making sure that the summit was a success.



**William Kootsikis** of the National Highway Traffic Safety Administration (NHTSA) gives national highway statistics to the audience.

participants to the workgroups, such that each workgroup had members from all the 5Es of safety. This type of structure ensured that the strategies developed in the individual emphasis area workgroups were balanced and multi-disciplinary.

Following completion of the workgroup sessions, participants will reconvene to report back at a summit to present their results and recommendations. The core committee will then be responsible for consolidating the workgroup strategies and generating the actual plan that will ultimately be approved by the Director of Transportation. HDOT anticipates finalizing the SHSP and begin implementation of the initial components by the end of this year.

HDOT and their public and private safety partners are undertaking this effort because it is essential to the safety of all Hawaii's road users. Hawaii currently averages approximately 140 traffic accident fatalities every year. Through the efficient and effective implementation of the strategies developed through this plan we may reach the SHSP goal of reducing the number of fatalities on Hawaii's roadways to 100 or fewer by 2012.

Following the summit, the safety partners have engaged in a series of workgroup sessions through February and March. Each workgroup focused on one of the following emphasis areas identified by the core committee:

- Aggressive Driving
- Impaired Driving
- Seat Belt Use
- Pedestrian and Bicycle Safety
- Motorcycle and Moped Safety
- Infrastructure Design (Engineering)
- Safety Data Systems

Each workgroup followed a facilitated process that started with problem identification and concluded with prioritization of recommended strategies. Workgroups were also provided with reference material and data presentations to aid in the decision making process. The core committee was responsible for assigning



**Shevaun Low** (OMPO) and **Jan Higaki** (HDOT) lead their Emphasis Area workgroup in a discussion.

## HAWAII DOT RES

Note from the Editor:

HLTAP has recently received the following final research reports on studies performed under the State Planning and Research (SPR) Program of HDOT:

- (1) "Correlation of Resilient Modulus of Fine-Grained Soils with Common Soil Parameters for Use in Design of Flexible Pavements," Philip S.K. Ooi, Ph.D., P.E., August 2006.
- (2) "Test of Prestressed Concrete T-Beams Retrofitted for Shear and Flexure using Carbon Fiber Reinforced Polymers," Alison Agapay, Ian N. Robertson, August 2004.
- (3) "Superpave Mix in Hawaii Performance Effects of Using Local Materials and Construction Practices on the Production, Paving Operations, and Short Term Characteristics of Superpave Mix," Steven Ege and Garret Okada, July 2005.

A summary of the finding of the first study appeared in the Winter 2003 HLTAP newsletter. The second study is featured below:

## Carbon Fiber Reinforced T-Beams

By Ian N. Robertson and Alison A. Agapay, University of Hawaii at Manoa

### Introduction

In 1997, an existing precast, prestressed T-beam in the Ala Moana Shopping Center parking garage, in Honolulu, Hawaii, was strengthened in flexure using carbon fiber reinforced polymer (CFRP) strips epoxy bonded to the soffit of the 24 foot long beam. When the parking garage was demolished in June 2000, this beam and two control beams were salvaged and brought to the University of Hawaii for testing. Flexural tests were performed on both unstrengthened and strengthened beams under four-point loading in the Structures Laboratory. The CFRP retrofit significantly increased the flexural capacity of the beam while also increasing its flexural ductility. The failure moment was well in excess of the nominal moment capacity predicted using the strain-compatibility procedure described in the American Concrete Institute (ACI) 440R-02 report.

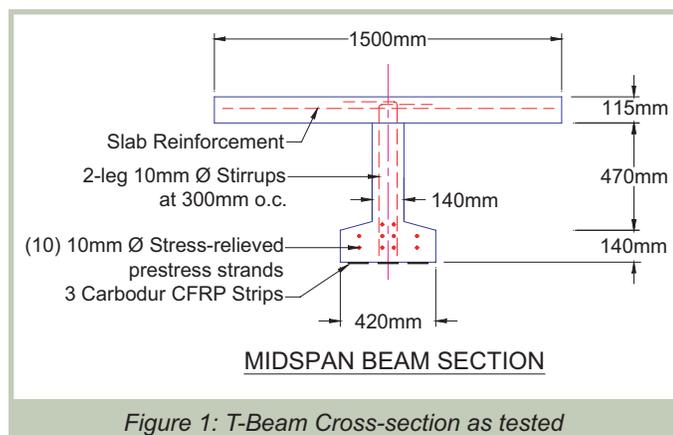


Figure 1: T-Beam Cross-section as tested

The CFRP retrofit was designed in 1997 by Martin and Bravo Structural Engineers, Honolulu, Hawaii, following design procedures presented in the literature at the time. The surface of the concrete was prepared by grinding to remove paint and weak surface paste. The CFRP strips were cleaned prior to installation and a layer of Sikadur 30 Hi-Mod Gel epoxy was placed on the soffit of the beam. The strips were then pressed onto the epoxy using a roller.

The cross-sectional dimensions of the beams are shown in *Figure 1*.

Both control and strengthened T-beams were tested under four-point loading. *Figure 2* shows the strengthened T-beam in the test frame prior to testing. Because of the enhanced flexural capacity provided by the CFRP strengthening, the flexural capacity of this T-beam now exceeded the theoretical shear capacity. In order to prevent a premature shear failure, shear reinforcement was installed on the beams in the form of CFRP wet lay-up stirrups bonded to the web in the left half of the beam and CFRP wet lay-up sheets bonded to the surface of the web on the right half of the beam.

### Control T-beam response

The theoretical moment capacity of the control beam as predicted by the ACI 318-02 code, and using measured strengths of concrete and prestress steel, was 588 kN-m but the test beam was unable to reach this moment capacity. The midspan flexural crack

## RESEARCH PROGRAM

continued to open as the load was increased, with final flexural failure occurring at a bending moment of 574 kN-m and midspan deflection of 78 mm when the ten prestress strands ruptured at this center crack. This failure strength was 2% below the ACI code nominal capacity.

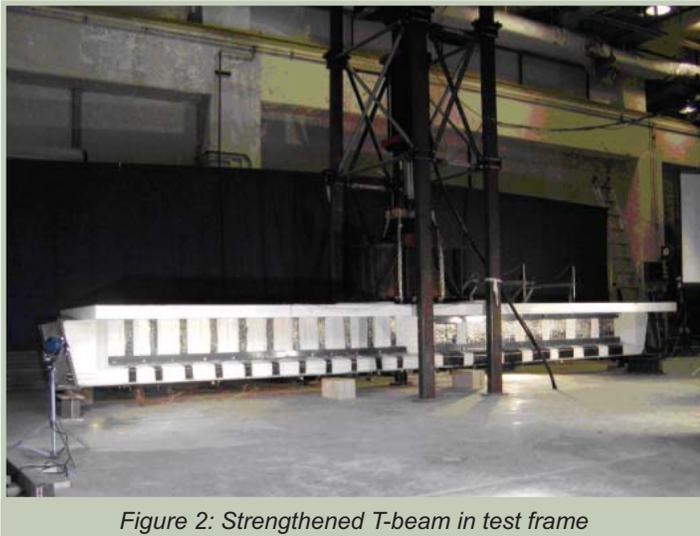


Figure 2: Strengthened T-beam in test frame

### Strengthened T-beam response

The strengthened beam was tested under the same loading conditions as the control T-beam. During the flexural test, the response was similar to that for the control specimen until flexural cracking of the beam. The post-cracking stiffness for the strengthened T-beam was greater than that for the Control, and did not degrade as rapidly. The ACI440R-02 report was used to predict the failure bending moment. The anticipated nominal moment capacity of 846 kN-m was easily exceeded by the strengthened beam, which supported a maximum moment of 984 kN-m prior to failure, 16% greater than the predicted value. This represents a 71% increase in flexural strength compared with the control specimen, while the ACI 440R-02 suggests the increase to be 44% compared with the ACI 318 nominal capacity. The apparent conservative prediction using the ACI 440R-02 procedure is attributed to the debonding coefficient which limits the strain capacity of the CFRP strips to simulate premature debonding. Because of the unpredictable nature of a debonding failure, reasonable conservatism is warranted.

The maximum midspan deflection for T-beam 2 was 100 mm compared with the 75 mm deflection for the control

specimen. The addition of CFRP flexural strengthening increased the ductility of the beam. Failure occurred when the CFRP strips delaminated from the bottom of the beam. This delamination appeared to initiate at the base of a flexure-shear crack that had formed just outside the left load point. Vertical offset in the soffit of the beam on either side of this crack may have contributed to the initiation of delamination.

### Conclusions

The following conclusions were drawn based on the results of these tests.

- Sika Carbodur CFRP pre-cured strips epoxy bonded to the soffit of the strengthened beam significantly increased the flexural strength over that of the control beam without reducing the beam ductility.
- There was no visually noticeable degradation of the CFRP strips, CFRP fabric wraps or epoxy bonding agents during the 5 years of field exposure between application in 1997 and testing in 2002.
- The ACI 440R-02 strain-compatibility procedure for estimating the flexural strength of concrete beams with externally bonded CFRP appears to be conservative for the condition tested here. The failure bending strength of the retrofit beam was 16% greater than that predicted by the ACI 440R-02 report procedure.

### Acknowledgements

Appreciation is extended to Adriano "A. B." Bortolin of Sika Products, USA, and Brian Ide for providing valuable information concerning the original FRP application, and **Chandler Rowe** and his colleagues at PlasTech Inc., Honolulu, Hawaii, for donating their labor and expertise in the repair of the recovered beams and for installation of the shear retrofit materials at the UH Structural Engineering laboratory. This project was funded through research grant No. 46507 from the Hawaii Department of Transportation Research Board. This financial support is gratefully acknowledged. The opinions and observations made in this paper are those of the authors and do not necessarily reflect the opinion of any of the project sponsors.

## ENGINEERING EXPO 2007

The University of Hawaii's College of Engineering held their annual Engineering Expo on February 9, 2007. This year approximately 500 high school students from schools around the state competed in seven engineering games: Bottle Rocket, Coaster Mania, Model Paper Column, Motor Building, Mouse Trap Racers, Water Drop and Wendy's Bubble-Blowing. The following is a list of the winners for each of the competitions:

### Bottle Rocket

1st: McKinley High School  
2nd: Farrington High School  
3rd: McKinley High School

### Model Paper Column

1st: Farrington High School  
2nd: Moanalua High School  
3rd: Moanalua High School

### Mouse Trap Racers

1st: Farrington High School  
2nd: Farrington High School  
3rd: Mililani High School

### Wendy's Bubble-Blowing

1st: McKinley High School  
2nd: Mililani High School  
3rd: Mililani High School

### Coaster Mania

1st: Kihei Charter School  
2nd: Roosevelt High School  
3rd: Farrington High School

### Motor Building

1st: Kamehameha Schools  
2nd: Kaimuki High School  
3rd: McKinley High School

### Water Drop

1st: Roosevelt High School  
2nd: Maui High School  
3rd: Campbell High School

Special thanks to the College of Engineering student organizations, Energy Industries, Hoana Medical, CUG-V, isisHawaii, Women in Technology, Maui Economic Development Board and the College of Engineering students, faculty and staff for their continued support and dedication. For additional information on participation or sponsorship in future events, please contact **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.



## 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.

## FREE PUBLICATIONS

1. **NCHRP-Report-365 (1998)** - Travel Estimation Techniques for Urban Planning
2. **TCRP-Report-31 Volume 1 (1998)** - Funding Strategies for Public Transportation - Volume 1: Final Report
3. **TCRP-Report-31 Volume 2 (1998)** - Funding Strategies for Public Transportation - Volume 2: Casebook
4. **SHRP-P-338 (1993)** - Distress Identification Manual for the Long-Term Pavement Performance Project
5. **NCHRP-Report-435 (1999)** - Guidebook for Transportation Corridor Studies: A Process for Effective Decision-Making
6. **TCRP-Report-40 (1998)** - Strategies to Attract Auto Users to Public Transportation
7. **NCHRP-Synthesis-241 (1997)** - Truck Operating Characteristics
8. **NCHRP-Synthesis-280 (1999)** - Seven Keys to Building a Robust Research Program
9. **TCRP-Report-30 (1998)** - Transit Scheduling: Basic and Advanced Manuals
10. **NCHRP-Synthesis-254 (1998)** - Service Life of Drainage Pipe
11. **NCHRP-Synthesis-256 (1998)** - Submittal of Bid Proposals in Electronic Format
12. **NCHRP-Synthesis-259 (1998)** - Management of Surface Transportation Systems
13. **TCRP-Report-49 (1999)** - Using Public Transportation to Reduce the Economic, Social, and Human Costs of Personal Immobility
14. **TRR-1634 (1998)** - Managing Urban Traffic Systems: Freeway Operations, High-Occupancy Vehicle Systems, and Traffic Signal Systems
15. **TCRP-Report-37 (1998)** - A Handbook: Integrating Market Research into Transit Management
16. **NCHRP-Synthesis-244 (1997)** - Guardrail and Median Barrier Crashworthiness
17. **NCHRP-Report-434 (1999)** - Guidelines for Longitudinal Pavement Profile Measurement
18. **TCRP-Report-34 (1998)** - Assessment of the Economic Impacts of Rural Public Transportation
19. **NCHRP-Report-426 (1999)** - CAESAR: An Expert System for Evaluation of Scour and Stream Stability
20. **NCHRP-Report-389 (1997)** - Macroeconomic Analysis of the Linkages Between Transportation Investments and Economic Performance
21. **TCRP-Report-33 (1998)** - Transit-Friendly Streets: Design and Traffic Management Strategies to Support Livable Communities

**We are cleaning and reorganizing the Transportation Library!  
Please take the time to review this list. Any remaining copies will  
be discarded by JUNE 2007.**

### Hawaii LTAP Transportation Library

The Hawaii Local Technical Assistance Program Library is located in Holmes Hall 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 -  
<http://hltap.eng.hawaii.edu/video.html>

Publications -  
[www.eng.hawaii.edu/~tlib](http://www.eng.hawaii.edu/~tlib)

Website:  
<http://hltap.eng.hawaii.edu/>

For more information, please contact us at 956-8719.



## Director's Note

by C.S. Papacostas



Last year, when I came back from the January meeting of the National LTAP/TTAP that was held in conjunction with the annual meeting of the Transportation Research Board (TRB) in our nation's capital, I shared with you the fact that increasing emphasis was being placed on innovative financing methods, including various types of public-private-partnerships (PPP).

This trend is gaining momentum, especially since, given current patterns, the highway trust fund is not expected to keep up with the growth of system capacity needs.

Several sessions on the TRB meeting were dedicated to related issues leading to an increasing inventory of case studies that illustrate, successes, failures and lessons learned.

Speaking on the general subject to the LTAP meeting this year, FHWA Administrator Rick Capka also mentioned the appointment of a "Surface Transportation Policy and Revenue Study Commission."

The commission's expressed purpose is to complete "a comprehensive study of the national surface transportation system and the Highway Trust Fund" and to develop alternative funding approaches. A report of the findings is expected in July of this year.

Changing the subject, I'd like to report that the Hawaii LTAP has agreed to assist in three major program activities this year: the development of the state's highway safety strategic plan; helping the FHWA, HDOT and the counties to implement the recently signed "stewardship plan" that redefines oversight responsibilities; and a construction career activity for high school students.

We are always open to your suggestions for training activities that can enhance your operations. Please let us know what you need.

## Program Manager's Note

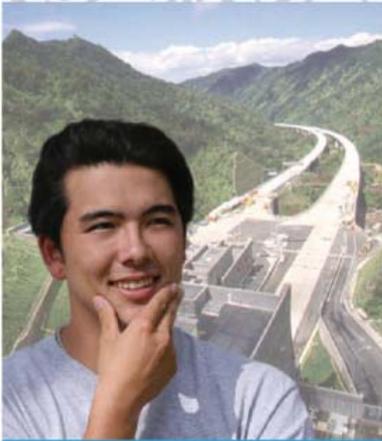
by Juli Kobayashi



We are extremely excited to be working with **Melanie Martin** (HDOT Office of Civil Rights), **Wayne Kaneshiro** (FHWA), the various representatives from the trade organizations and the University of Hawaii in planning the very first Construction Career Days (CCD) event here in Honolulu on October 25 & 26, 2007. The CCD will be held at Honolulu Community College and is offered to high school students who are interested in the many different aspects of the construction industry from engineering, architecture to the trades.

If you are interested in being part of our energetic planning committee, please contact me at (808) 956-9006 or [juli@hawaii.edu](mailto:juli@hawaii.edu).

### The future of Hawai'i's construction industry depends on YOU!



**Hawai'i Construction Career Days**

Two Dates:  
Thursday, October 25, 2007  
OR  
Friday, October 26, 2007

**Honolulu Community College**

For more information please contact:

Juli Kobayashi  
Hawai'i Local Technical Assistance Program (HLIAP)  
Phone: (808) 956-9006  
Email: [juli@hawaii.edu](mailto:juli@hawaii.edu)

Melanie Martin  
Hawai'i Department of Transportation (HDOT)  
Phone: (808) 587-2023  
Email: [melanie.martin@hawaii.gov](mailto:melanie.martin@hawaii.gov)

### Construction Career Days

**For High School Students**  
Grades: 9 - 12

Will feature:

- Hands on activities
- Operation of heavy equipment
- Interactive exhibits and trade displays
- Demonstration projects
- Architecture and engineering



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

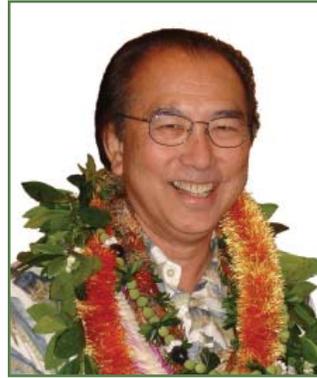
In this issue, we are featuring the Island of Oahu. The USS Arizona Memorial was built in 1961 as a tribute to all the men and women who lost their lives on December 7, 1941. On that historic day, 1,100 sailors were caught unaware by the Japanese bombs that sank the mighty ship and brought the United States into World War II. The memorial is 184-feet long and carefully crosses over the Arizona's mid-section. A marble-walled chapel at the far end of the memorial lists the names off all the sailors entombed there.

## HAWAII LTAP NEWS



The Hawaii LTAP would like to welcome our newest student assistant, **Kristine Miyasato**. Kristine is a freshman majoring in business and marketing. She is a recent graduate of Hawaii Baptist Academy. In her spare time she enjoys going to the beach, shopping, spending time with friends and family, and coaching for volleyball and cheerleading.

### CONGRATULATIONS AND MAHALO TO PAUL WON!



On December 21, 2006, a farewell party was held at Hale Ikena in Fort Shafter to thank **Raymond Paul Won** for all his years of service to the City and County of Honolulu. **Paul Won** dedicated 36 years of service to the City and retired from the Department of Transportation Services.

We would like to welcome **Claude Matsuo** to our Hawaii LTAP Advisory Board. He will be taking the place of **Paul Won**, who recently retired, as the representative for the City & County of Honolulu, Department of Transportation Services.



**Claude Matsuo, P.E.**, graduated from Kaimuki High School in 1968 after which he attended the University of Hawaii at Manoa, receiving a Bachelor of Science degree in Civil Engineering in 1972. Mr. Matsuo worked for the State of Hawaii, Department of

Transportation for eight years during which time, in 1977, he received his professional civil engineering license. In 1981 he began his long career with the City & County of Honolulu (serving) as an assistant Traffic Engineer in the Department of Transportation Services, Traffic Engineering Division, East Honolulu Operations. Currently, Mr. Matsuo is the Head of the Urban Honolulu Regional Branch, in the Department of Transportation Services, Traffic Engineering Division.

Paul, a Maui native, was a 1959 graduate of Punahou High School and later graduated from the University of Hawaii in 1964 with a degree in Civil Engineering. Paul served in the Army from 1964 to 1966. After the Army, Paul worked for three years at Hawaiian Tel. Paul later joined the City and County of Honolulu's Department of Public Works as a structural engineer in 1970. In 1989, Paul transferred to the Department of Transportation Services (DTS) and worked his way up to Division Chief to the DTS in 1998. Paul retired from the City on December 29, 2006.

Paul was an Advisory Board member of LTAP for six years and is currently the active President of the Hawaii Institute of Transportation Engineers (ITE). His favorite hobbies include shopping at Goodwill and searching Online for collectibles. We will miss you Paul! Mahalo and Best Wishes!



Paul's retirement party



# HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

## Executive Board

**Steven Ege**  
Engineer  
Hawaii Department of Transportation  
Materials Testing & Research Branch

**Wayne Kaneshiro**  
Safety Engineer  
FHWA Hawaii Division

**Jan Murakami**  
Personnel Management Specialist  
Hawaii Department of Transportation  
Highways Division, Personnel Staff

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The Hawaii Local Technical Assistance (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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