HAWAIIAN CONNECTIONS

THE HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

VOLUME 11, No. 1 SPRING 2009

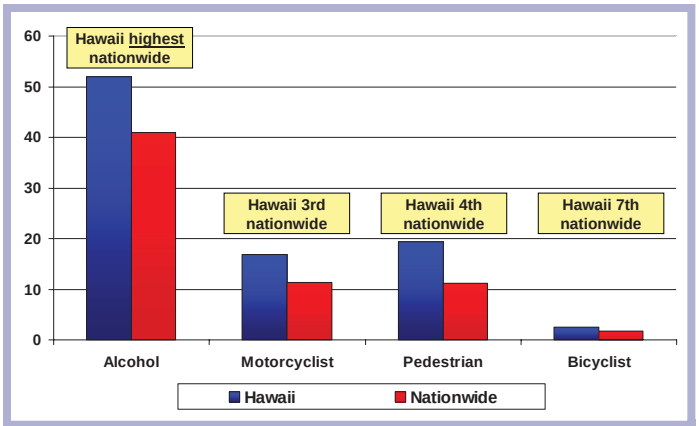
In This Issue

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

HAWAII'S HIGHWAYS MODERNIZATION PLAN

By: Brennon Morioka, HDOT

For far too long the mantra has been "do more with less." But there comes a point where limited resources have a significant and detrimental impact on the health of our State Highway System. We have reached that point and are faced with the decision to continue to do business as usual or drastically change the way we approach our highways program.



Saving Lives: Fatalities by Percentage, Hawaii vs. Nation (2006 Statistics)

The Lingle-Aiona Administration and the Legislature agree status quo is not working. In response, through close collaboration, we worked to develop a comprehensive $4 billion plan to make significant improvements to our highways and address critical issues such as safety and congestion.

We lose an average of 140 lives on Hawaii's roadways each year. In 2006, Hawaii had the highest fatality rate in the nation for alcohol related fatalities, third highest for motorcycle related fatalities, fourth in pedestrian fatalities, and seventh highest fatality rate for bicycle related fatalities. If these statistics were linked to a disease, this would be an epidemic.

Increased traffic congestion threatens our quality of life. The morning commute on the H-1 Freeway from Kapolei into downtown Honolulu has increased to an average of 65 minutes. The more time we spend in gridlock, the more wear and tear on our vehicles, the more we spend on gas, and the less time we spend with our families or at work.

The DOT is also facing a $7 billion infrastructure gap due to years of deferred maintenance and lack of money. At current funding levels of $250 million annually, it is estimated to take 30 years to address the current infrastructure needs.

This plan calls for a one-time, extraordinary infusion of $2 billion to aid in rectifying criti-

(Continued on Page 8)

OAHU REGIONAL TRANSPORTATION PLAN UPDATE

By Marian Yasuda, OahuMPO

The Oahu Metropolitan Planning Organization (OahuMPO) is beginning a two-year effort to update the Oahu Regional Transportation Plan (ORTP) to the year 2035. The ORTP is the official guide for the development of the major surface transportation facilities and programs to be implemented on Oahu. It provides a long-term vision and outlines transportation goals, objectives, and policies for Oahu. A major component of this plan is the identification of short-range and long-range strategies and actions that are designed to promote the development of an integrated intermodal transportation system that facilitates the safe, efficient, and economic movement of people and goods.

Throughout the ORTP 2035 development process, there will be many opportunities for stakeholders and communities around Oahu to become involved and provide input. The OahuMPO Web site, http://www.oahumpo.org, will provide the latest information on those opportunities. The OahuMPO maintains a comprehensive mailing list which will receive meeting notices and opportunities for review and comment on the plan as it progresses.

To stay informed and be engaged, call or email the OahuMPO and ask that your contact information be added to the mailing list for this important process.

Oahu Metropolitan Planning Organization
OahuMPO@OahuMPO.org
(808) 587-2015

A MOMENT IN HISTORY

By C.S. Papacostas, Hawaii LTAP

U.S. ROADS TO COVER OAHU

So went the newspaper headline on August 22, 1912. This "Special Star-Bulletin Correspondence" carried a dateline that specified Schofield Barracks at Leilehua as its place of origination.

From the army post, now the largest under the Stars and Stripes, will radiate a series of military roads, the spokes of the wheel, over which can be rushed artillery, cavalry and infantry, to any point on the shore line of the island which could possibly be used as a landing point for an invading force, the first paragraph explained. Incidentally, Oahu was referred to as the "Gibraltar of the Pacific."

This, the story continued, was consistent with the policy of the War Department "to make the island of Oahu impregnable" under the direction of a defense board headed by Brig. Gen. M. M. Macomb. Consistently, the previous December, it was "announced that Oahu was to be girded by a chain of defensive fortifications" and "military roads were to play a leading part in this defensive plan."

The military roads were planned to "be open to the people of the island, subject to certain restrictions." The military connection is also seen in the interstate highway system whose full designations is the "National System of Interstate and Defense Highways."

HAWAII DOT RESEARCH PROGRAM

Innovative Drilled Shaft Concrete Mix

By: Harold Hamada, Technical consultant for KSF, Inc.

The North-South Road Separation structure on Interstate Route H-1 required five feet diameter drilled shafts to support the bridge structure. The five feet diameter is on the border line between having over-heating or not having over-heating of the placed concrete. Generally, pozzolans (fly ash, silica fume) are used to replace Portland cement to reduce the temperature of the in-placed concrete. Pozzolans are not available in Hawaii. By reducing cement and adding water reducing admixture, a concrete mix was developed which satisfied the compressive strength requirement as well as the temperature requirement. Another requirement of the concrete was to stay fluid for a period of three hours after initial casting. The concrete mix was evaluated using "Concrete Works," a computer program developed through funding by Texas Department of Transportation. Thermocouples were placed in the test shaft to measure the temperature of the placed concrete. The time-temperature measurements duplicated the computer prediction. The mix design yielded concrete which met the compressive strength and maximum core temperature requirements. In addition no dishing at the top of the drilled shaft was observed. Cores verified that a uniform concrete density throughout the drilled shaft was attained.

Trial shaft cage inner & outer log sensors.

Slump 0 hours, 8.5 inches.

Slump 4 hours, 6 inches.

Shrinkage Reducing Admixtures in Bridge Decks

By: Harold Hamada, Technical consultant for KSF, Inc.

As part of a quest to reduce the number of bridge joints HDOT is evaluating and applying shrinkage reducing admixtures (SRA). The first application of SRA on a bridge deck was the Keaiwa Stream Bridge, located in Pahala, Hawaii. The slab bridge has seven spans. The abutments are skewed. Each span length is 35 feet. Vibrating wire strain gages were placed at several locations in the bridge deck to monitor strains for a period of one year. The measurements confirmed a reduction of shrinkage strain. The bridge has been in service since 2001, and to date the deck has no visible cracks

SRA test panels.

Rectangular block (8" x 36" x 36") test pieces were placed in the field to evaluate shrinkage of concrete with and without SRA. Vibrating wire strain gages were placed in the specimens and typical slab reinforcement was placed in the test pieces. Two SRA's were evaluated: Tetraguard AS20 and Eclipse. The measurements were taken for a period of one year. Increase in reinforcing steel reduced the specimen concrete strain, and the SRA reduced the shrinkage 60 percent in the unreinforced test pieces.

A second application of SRA was the Kii Bridge, located

(Continued on Page 6)

NEWS FROM O

Cement and Concrete Products Industry of Hawaii

By Wayne Kawano, CCPI of Hawaii President

Alfred Yee, Honorary Member of CCPI, Recognized

The Cement and Concrete Products Industry of Hawaii proudly extends its congratulations to **Dr. Alfred Yee** recipient of the distinguished 2009 HCES Lifetime Achievement Award, recently presented at the HCES Engineers Week dinner banquet. Dr. Yee was the first Honorary Member of CCPI in 1985.

This is a most deserving award for someone who has indeed dedicated his lifetime, and continues to do so, for the advancement of the engineering profession. Presently, Dr. Yee serves as President of Applied Technology Corporation in Honolulu and also serves as Director of Precast Design Consultants Pte. Ltd in Singapore, both specializing in precast prestressed concrete design with projects in the United States and Internationally.

It was always special to attend presentations given by Dr. Yee. But hearing his acceptance speech was especially heart felt when he introduced his wife and family as well as his associates for their support throughout the years. He also reflected on the engineering school days at Rose-Hulman Institute of Technology and at Yale University, where he obtained his masters degree in structural engineering. And yes, references to the construction of the Arizona Memorial concrete floating platform brought back many memories of the many other projects engineered by Alfred Yee.

Over the years, he has served on numerous technical committees of various national engineering societies such as ACI, PCI, and ASCE. For his contributions, he was awarded the honorary memberships to ACI and PCI, the highest recognition accorded to any member of these organizations.

In 2004, Dr. Yee was named a Titan of the PCI in recognition of his outstanding contributions to the industry; for prominence in industry innovation and change, for positive leadership in industry altering development and expansion and for advancing and accelerating the growth of the North American Precast and Prestressed concrete industry.

Thank you Al…. we look forward to seeing your next innovative engineering achievement! Mahalo!

American Public Works Association Hawaii Chapter

16TH Annual Education Fund Golf Tournament

Info:	Thursday, April 9, 2009 Shotgun Start 12:30 p.m. Check-in from 11:00 a.m. Ala Wai Golf Course
Entry Fee:	$125 per person
Format:	4 person team modified scramble
Handicap:	Maximum - 30 for men/35 for women
19th Hole:	Immediately to follow at the Club House.
Deadline:	Wednesday, April 1, 2009

If you have any questions please call **Rouen Liu** at 543-7245.

UR PARTNERS...

Engineers and Architects of Hawaii

By Michael Albright, President

A Brief History of the Engineers and Architects of Hawaii

The Engineers and Architects of Hawaii was originally founded as the Hawaiian Engineering Association on May 2, 1902. Since that first meeting, meetings have been held almost every Friday, except for holidays, to this day.

In the year 1902, when this organization was formed, **Theodore Roosevelt** was President of the United States and **Sanford Dole** was the Governor of the Territory of Hawaii. Members in those days consisted principally of sugar technologists interested in sugar plantation problems and a few engineers, architects, and surveyors.

By 1920, there was a need for an engineering club with a much broader scope than sugar technology. Thus, the Hawaiian Engineering Association became the Honolulu Chapter of the American Association of Engineers (AAE). For five years, this chapter flourished, gained membership and filled the need of a forum for discussion among the many fields of engineering. However, with the remoteness and isolation of Hawaii from the Mainland and the lack of interest from the National AAE, the Honolulu Chapter was dissolved in 1925 to form the Engineering Association of Hawaii (EAH).

Since 1925, the members and officers of the EAH have represented the cross-section of all the engineering fields in the planning, development, operation, and maintenance of all type of structures, facilities, and research required by the civilian as well as the military population of a modern and progressive State.

In 1992, the association changed its name from the Engineering Association of Hawaii to the Engineers and Architects of Hawaii to reflect that it is an association for both architects and engineers.

Over the years, the most prominent of Hawaii's leaders from the engineering and architectural communities have served as President. Some notable examples are: **Alonzo Gartley**, Manager of the Hawaiian Electric Co., as the First President (1902); **John H. Wilson**, Mayor of the City and County of Honolulu (1920); **Vladimir Ossipoff**, legendary architect (1947); and **Russell M. Towill**, civil engineer (1950).

Of interest to the Hawaii LTAP group might be the following excerpt from the March 1929 newsletter regarding the first automatic traffic signals in Honolulu:

*"At last week's meeting "Traffic Control" was the subject of the day. The first speaker was **H.R. Slocum**, Head Salesman for the Hawaiian Electric Company, who described the mechanism and control of the two sets of automatic signals which were recently installed for test purposed at the Bishop-King and the Fort-King corners.*

*Mr. Slocum was followed by Sheriff **Pat Gleason** who gave some interesting figures on the traffic census which was taken while these signals were in operation. He pointed out that on the first morning of their operation, the time allotment for King Street was 60 seconds and for Bishop Street it was 24 seconds with a 4-second caution interval between each change. This was gradually cut down to 20 for King and 12 for Bishop at which setting the best efficiency was obtained. In other words, a complete cycle of 40 seconds with the intervals 20-4-12-4 seemed to give about the best results. Approximately 16 autos and 40 pedestrians were the average per cycle.*

Mr. Gleason stated that no conclusion had been reached as to the type of signal he would finally advocate for Honolulu but declared that some form of automatic signal was desirable and that Honolulu would have to come to it sooner or later. Traffic-control, he said, is no longer a one-man job in Honolulu but an engineering problem which should be in the hands of a traffic commission."

Today, EAH meets weekly on Fridays at noon, upstairs at the Fort Street Grill located in TOPA Towers (Ewa Tower).

Our programs are varied and cover a wide range of topics. We have recently had programs on: Both pro and con on the Honolulu Rail Project; Dark Skies – how to achieve less light pollution and see better on our roadways with proper street and roadway lighting; Tsunami Hazards in Hawaii; The History of Coconut Island; and one on Modern Shipbuilding and Launching Technologies with an additional report on the Port Royal – the Navy ship recently grounded near the Honolulu Airport.

We invite you to come and listen to our speakers or come and present if you have a burning passion that you would like to inform us about.

Information on our meetings can be found at: http://eahawaii.googlepages.com/home

HAWAII DOT RESEARCH

in Kahuku. This is an integral abutment slab bridge with an 80-foot span. Vibrating wire strain gages were placed in the pre-stressed planks. The gages were monitored from initial casting to completion of the bridge. Vibrating wire gages were also placed in the topping over the instrumented pre-stressed planks and measurements were taken for a period of two years. Computer simulation of the field measurements was made. Standard six inch diameter concrete cylinders were cast to evaluate creep and shrinkage.

Keaiwa Bridge road view.

A concrete mix using blended fibers with SRA is being investigated for use in bridge decks. The bridge deck of the North-South Road Separation structure on Interstate Route H-1 was placed with this mix. The blended fibers will reduce plastic shrinkage, will increase the fatigue limit of the concrete and will increase ductility. An air entraining admixture is added to improve workability. The admixture is a patented polymer that is formulated to be stable and inert. A SRA is added to reduce shrinkage. Concrete cylinders are being tested for creep and shrinkage. Preliminary results show a dramatic reduction in shrinkage.

Field Behavior and Numerical Study of an Integral Abutment Bridge Supported on Drilled Shafts

By Phillip Ooi, College of Engineering

Integral abutment bridges (IABs) are jointless bridges that enjoy the following advantages over conventional bridges:

1. Lower maintenance costs due to elimination of joints and bearings;
2. Simpler and more economical construction (e.g., only a single row of vertical piles is needed at the abutment plus expansion joints and bearings are eliminated);
3. Added redundancy and capacity during seismic events and against buoyancy loads during flooding and wave loading during hurricanes or tsunamis;
4. Improved ride quality;
5. Abutments and piles resist uplift forces acting on beams at the end spans in IABs. In conventional bridges, uplift of beams at the end spans can occur during deck placement and vehicular movement because the beam is not structurally tied to the abutment;
6. Integral abutments spread the lateral loads throughout the structure/soil system so that all supports accommodate these loads. This reserve capacity is not available in conventional bridges since the lateral loads are not distributed to the abutments; and
7. Bridge replacements can be accomplished easily with IABs since they do not require large footings and they can be readily constructed behind existing buried foundations without the need for large

Instrumented drilled shaft rebar cage with the inclinometer casing attached.

PROGRAM (Continued from Page 3)

excavations.

A disadvantage of IAB is that because the abutments are tied to the superstructure, more factors contribute to lateral movements of the abutments than in conventional bridges. These additional factors include:

1. Cyclic thermal expansion and contraction of the superstructure; and
2. Shrinkage and creep of the superstructure if it is made of concrete.

Data acquisition system powered by a marine battery stored in manhole.

Because of these additional contributions to lateral movements, the majority of IABs in the United States are supported on a single row of steel-H piles to provide the flexibility necessary to minimize the attraction of large lateral loads to the foundation and abutment. In Hawaii, steel H-piles have to be imported, corrosion tends to be severe in the middle of the Pacific Ocean and the low buckling capacity of steel H-piles in scour-susceptible soils has led to a preference for the use of concrete drilled shaft foundations.

An 80-foot-long, single span, drilled shaft-supported-IAB in Kahuku was instrumented with inclinometers, earth pressure cells and strain gages to study its behavior during and after construction over a 45-month-period. The following interesting observations were made:

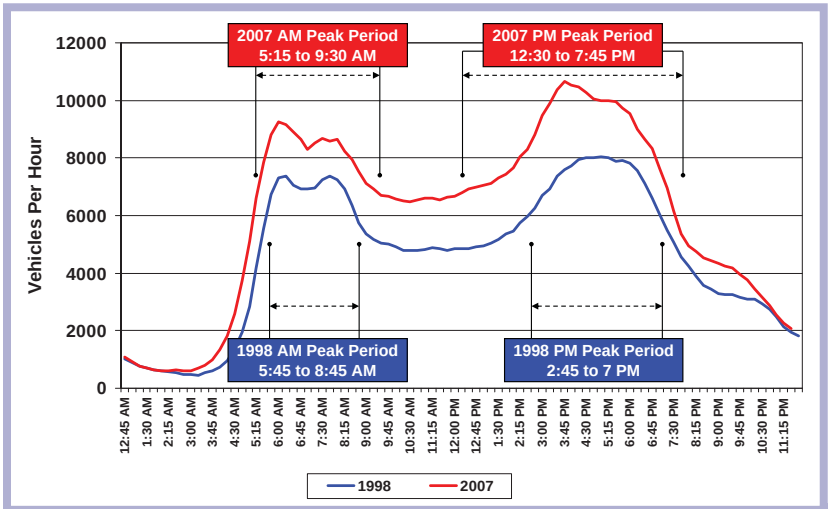
1. Strain gage data indicate that drilled shaft foundations worked well for this integral bridge. After 45 months, the drilled shafts appear to remain uncracked. However, inclinometer readings provide a conflicting viewpoint.
2. Full passive earth pressures never developed behind the abutments as a result of temperature loading because thermal movements were small and the long term movements were dominated by concrete creep and shrinkage of the superstructure that pulled the abutments towards the stream.
3. In the stream, hydrodynamic loading during the wet winter season had a greater effect on the abutment movements than seasonal temperature cycling.
4. After becoming integral, the upright members of the longitudinal bridge frame were not vertical because the excavation and backfilling process caused deep seated movements of the underlying highly plastic clay resulting in the drilled shafts bellying out towards the stream. This indicates the importance and need for staged construction analysis in design of integral bridges in these types of soil.
5. The drilled shaft axial loads from strain gages are larger than the working loads.

This same IAB was studied using the finite element method (FEM) in both 2- and 3-D. 3-D FEM yields larger overall pile curvature and moments than 2-D because in 3-D, the high plasticity soil is able to displace in between the drilled shafts thereby “dragging” the shafts to a more highly curved profile while soil flow is restricted by plane strain beam elements in 2-D. Measured drilled shaft axial loads were higher than the FEM values mainly due to differences between the assumed and actual axial stiffness and to a lesser extent on concrete creep in the drilled shafts and uneven distribution of loads among drilled shafts.

A final report for HDOT/FHWA that summarizes the findings of this research and that discusses the geotechnical design aspects of IABs is available. In addition, two journal papers relating to this work have been accepted for publication.

Completed integral abutment (Kii) bridge in Kahuku.

HAWAII'S HIGHWAYS MODERNIZATION PLAN (Continued from Page 1)



Saving Time: H-1 Freeway Hourly Volumes: Peak Traffic Periods, 2007 vs. 1998

cal deficiencies by accelerating the implementation of key programs and projects. This six-year program seeks to produce results today to help Save Lives, Save Time, Save Money.

To save lives, we plan to: (1) reduce average number of lives lost on our state highways to 100 or less per year; (2) bring 50 of the most deficient bridges up to current structural design standards, (3) pursue the top 15 sites identified in the rockfall and slope stabilization program; and (4) pursue the top ten sites identified in the shoreline protection program that are on the most critical routes.

We will implement strategies identified by the State Strategic Highway Safety Plan to address key areas of concern, including aggressive and impaired driving. We have proposed legislation this session to make our roads safer, including a bill that prohibits young drivers under the age of 18 from engaging in activities such as using cell phones, eating or grooming while driving. Other efforts include making physical road improvements, including installing guardrails and carrying out the Highway Safety Improvement Program, which targets locations with high accident rates.

There are unacceptable levels of congestion on every island, including on Queen Kaahumanu Highway and on Keaau-Pahoa Road on the Big Island, Honoapiilani Highway and Hana Highway on Maui, the H-1 freeway corridor and along Fort Weaver road on Oahu, and Kuhio and Kaumualii Highways on Kauai.

The Highways Modernization Plan proposes to: (1) achieve a minimum of ten percent reduction in congestion along two major corridors, within each county within ten years; (2) achieve a ten percent increase in overall operational efficiency of existing statewide infrastructure system; and (3) achieve a ten percent increase in the use of alternative travel modes.

Key strategies include expediting the implementation of 35 regional improvement projects to aid in relieving congestion and reducing recurring congestion by eliminating bottlenecks. Other strategies involve expansion of our Intelligent Transportation Systems to provide for well-informed commuters, optimized traffic systems, and service patrols to keep our roads flowing. The DOT is committed to enhancing its current bicycle and pedestrian programs to better promote and encourage alternative modes of transportation and provide greater opportunities to facilitate mass transit use.

In order to generate the additional revenues, the plan proposes to increase user fees and taxes through a combination of revenue sources including the state fuel tax, state vehicle registration fee, state weight tax, and the rental motor vehicle surcharge. The average taxpayers will pay an additional $170 in taxes and fees annually.

Being sensitive to the current economic downturn, these increases will not take effect until there is a one percent growth in Hawaii's job growth for two consecutive quarters. State economists believe this is a sign of a recovering economy and estimate that the trigger will occur in 2 to 3 years.

Greater accountability and transparency are vital to gaining public buy in. We will be more transparent than ever before, allowing the public to go to our website to monitor progress of projects and track how we spend every dollar the taxpayers are investing.

We believe these are smart investments that will yield even greater returns. The alternative is to do nothing and allow the conditions to worsen every year. We believe this is the right thing to do, the right projects to achieve the goals, and all for the right reasons. We know this is a solid and ambitious plan that will save lives, save time, and save money.

HAWAII LTAP ACTIVITIES

Compiled by Gail Ikeda, Hawaii LTAP

Our first workshop of 2009 was a joint effort with a new Hawai'i LTAP partner, PATH (Peoples Advocacy for Trails Hawai'i). The half-day seminar "Complete Street Design: Creating safe, efficient multi-modal transportation choices in Hawai'i", led by instructor **Preston Tyree**, was presented in two parts. The first was a general overview of the definition of Complete Streets, the State of Hawai'i policies and some of the related design standards. Part two involved the participants in case studies and focused on ways to integrate the philosophy of Complete Streets into current planning and design. We look forward to future collaborative workshops with PATH.

"Complete Street Design" participants observing a street.

Also in January, we were provided with a wonderful opportunity from the Federal Highway Administration to host an "OSHA 10-Hour Training" at no instructor cost. **Jerry Teeler**, of the American Road and Transportation Builders Association (ARTBA), taught a total of four sessions, two on O'ahu and one each on Kaua'i, Maui and the Big Island. This certification program focused directly on the hazards and situations that roadway construction workers face on a daily basis. Some of the emphasized topics included were: electrical safety, roadway work zones, excavations and trenching, night work, occupational health and collisions.

In February, we held two sessions of a two-day course "TCCC Construction Inspection, Workmanship, and Quality". This course was developed in partnership with the National Highway Institute and the Transportation Curriculum Coordination Council (TCCC). It covered the legal, liability, and risk issues, and quality assurance topics related to construction projects. With the goal of improving overall product quality and system performance, the course presented participants with approaches that helped improve the quality of field decisions and the implementation of decisive actions in the field.

Instructors, **Frank Julian** and **Jeffrey Shaw**, presented a basic 3-day course "Roadside Safety Design" and were able to add on an extra half-day for an emphasis on Cable Barriers. The first three days gave an overview of the AASHTO Roadside Design Guide. Participants learned to apply the clear zone concept to all classes of roadways; recognize unsafe roadside design features and elements and make appropriate changes; identify the need for a traffic barrier; and apply other highway hardware core competencies. The Cable Barrier portion of the workshop discussed critical design considerations for median and roadside cable barrier systems. It gave an overview of how the cable barrier has evolved and how it works.

Steve Jenkins, of the Montana LTAP Center, was invited to repeat his popular "Work Zone Safety Training" this year on O'ahu, Kaua'i, Maui and the Big Island. This half-day training course covered the five parts of a Traffic Control Work Zone, flagging duties, safety, uniformity and liability issues. Participants each received a copy of the Hawaii LTAP/DOT "Guidelines for Temporary Traffic Control" handbook to follow along with Steve's presentation.

***Steve Jenkins** teaching "Work Zone Safety".*

Also in March, we assisted the HDOT with three one-day sessions of "Context Sensitive Solutions (CSS)" workshops. The HDOT Administration fully supports the adoption of CSS and expects that CSS will become an integral part of the DOT's project development process. These workshops provided invited participants from the Counties and the State with some of the background and understanding necessary to apply CSS techniques within their area and were presented with real-world examples illustrating the benefits that can be derived from a successful CSS program.

For more information on any of these workshops please contact us at (808) 956-8367.

Director's Note

by C.S. Papacostas

Have you ever come across an issue and asked "I wonder how others are addressing this?"

Well, there is one place where, to a large extent, such questions can be answered at the click of your mouse:

A fully searchable, electronic library of highway specifications is provided by the FHWA at www.specs.fhwa.dot.gov.

According to the web site it "serves as a clearinghouse and electronic library where users can search, review, cross-reference, and download the most current specifications, construction manuals, and drawings. Although this site is maintained by the Federal Highway Administration, the materials on this site have been submitted by State Departments of Transportation and other agencies."

The section on specifications gives access to standard specifications and supplements, as well as to "innovative and emerging specifications."

Under the latter topic, you can find information on emerging technical specifications, alternative contracting and performance specifications; items such as intelligent transportation systems (ITS) and stakeless survey; various contracting options, including public-private partnerships; and performance specifications by topic area (e.g., bridge, pavement) or by specification type (e.g., design-build).

The construction manuals of the various states and Federal Lands Highways can be browsed or searched by keywords. Curiously, Hawaii is missing from the list!

Standard drawings are accessed via links to each agency's web site. Seven agencies (including Hawaii DOT) do not post their standard drawings, and Louisiana has them available for a fee. The various agencies provide the drawings in one or more formats (pdf, DGN, etc.), and some (such as New Jersey) also include CADD support and resource files.

The National Highways Specifications Web site (NHSW) resulted from an American Association of State Highway and Transportation officials (AASHTO) resolution as a peer exchange initiative.

FREE PUBLICATIONS

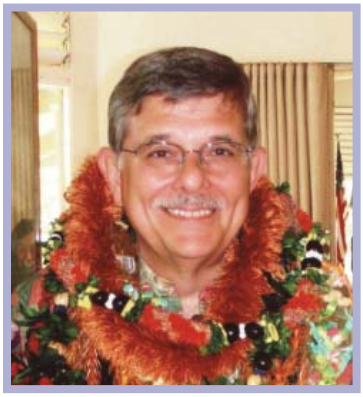
*We are cleaning and reorganizing the Transportation Library! Please take the time to review this list. Any remaining copies will be discarded by **JUNE 30, 2009**. Please call 956-2696 to request any copies.*

1. ***TCRP - 6 (1995)*** *Users Manual for Assessing Service-Delivery Systems for Rural Passenger Transportation*
2. ***TCRP - 20 (1996)*** *Measuring and Valuing Transit Benefits and Disbenefits*
3. ***TCRP - 21 (1997)*** *Strategies to Assist Local Transportation Agencies in Becoming Mobility Managers*
4. ***TCRP - 27 (1997)*** *Building Transit Ridership*
5. ***TCRP - 28 (1998)*** *Transit Markers of the Future*
6. ***TCRP - 29 (1998)*** *Closing the Knowledge Gap for Transit Maintenance Employee: A Systems Approach*
7. ***TCRP - 43 (1999)*** *Understanding and Applying Advanced On-board Bus Electronics*
8. ***TCRP - 45 (1999)*** *Passenger Information Services: A Guidebook for Transit Systems*
9. ***NCHRP - 393 (1997)*** *Design and Construction Guidelines for Downdrag on Uncoated and Bitumen-Coated Piles*
10. ***NCHRP - 406 (1998)*** *Redundancy in Highway Bridge Superstructures*
11. ***NCHRP - 417 (1998)*** *Highway Infrastructure Damage Caused by the 1993 Upper Mississippi River Basin Flooding*
12. ***NCHRP - 424 (1999)*** *Improved Design Specifications for Horizontally Curved Steel Girder Highway Bridges*
13. ***NCHRP - 425 (1999)*** *Designing Stone Matrix Asphalt Mixtures for Rut-resistant Pavements*
14. ***NCHRP - 430 (1999)*** *Improved Safety Information to Highway Design*
15. ***NCHRP - 433 (1999)*** *Guidelines for Developing and Maintaining Successful Partnership for Multimodal Transportation Projects*
16. ***TRR - 1478 (1995)*** *Concrete and Concrete Pavement Construction*
17. ***TRR - 1490 (1995)*** *Management and Maintenance of Bridge Structures*
18. ***TRR -1492 (1995)*** *Hot-mix Asphalt Design, Testing, Evaluation, and Performance*
19. ***TRR -1496 (1995)*** *Public Transportation 1995: Current Research in Planning, Management, Technology, and Ridesharing*
20. ***TRR - 1501 (1995)*** *Pavement-vehicle Interaction and Traffic Monitoring*

**Hawaiian Connections features scenic pictures from various locations in Hawaii. (Photos courtesy of the Hawaii Visitors and Convention Bureau).*

In this issue, we are featuring the island of Oahu. Oahu is the third largest island in the Hawaiian chain and is home to about three-fourths of the State's population. Honolulu is the Hawaii State capitol and is the 11th largest U.S. metropolitan city. Beautiful, and world-renowned Waikiki, is the top destination of the State. This man-made beach attraction encompasses 450 acres of top vacation fun, surf, hotels, shopping, dining, and entertainment.

HAWAII LTAP NEWS



It has always been **Larry Leopardi**'s goal in life to sit at a poker table in Nevada and utter those famous words "I'm all in!". Although he has yet to muster the courage to play Texas Hold 'Em Poker, his Hawaii experiences should prepare him well in meeting his lifelong goal. Back in the day, Larry decided to move to Hawaii with his wife Sopie (Janeta) and infant daughter Christine. He worked at the Ko Olina development as a construction engineer and later to make life interesting decided that he could also open a night janitorial business on the side. Later, he joined the State Hawaii Community Development Association (HCDA) working on the Kakaako Redevelopment project as chief engineer. After working on the closure of the landfill site and developing Kakaako Waterfront Park, Larry took the position of Chief of the Design Branch at the State Department of Transportation Highways Division. He then became Chief of the City's Division of Road Maintenance and Chief Engineer for the City's Department of Facility Maintenance. At that time he became a member of the Hawaii LTAP advisory board until his retirement in December 2008. He now resides in Nevada.

What did YOU think?

Editor's Note: In this feature, we quote our associates and stakeholders about our activities. This selection, highlights the Complete Street Design workshop held in January.

"I found that Complete Street Design course to be very informative and useful. The course objective has met my expectations and given me tools to design a street that will provide a safe environment for motorists, pedestrians, transit operators, and bicyclists of all ages and physical abilities. The topics covered will definitely improve my engineering skills and hopefully allow me to become a valued employee for the County of Kauai, Department of Public Works, Engineering Division....

...In summary, a community utilizing a Complete Street Design could result in increased property value by reducing transportation costs and travel time while providing a safe passageway for their users..."

Submitted by: **Paul Togioka**, County of Kauai, Department of Public Works.

GOT A BETTER MOUSETRAP?

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.

HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

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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