

# HAWAIIAN CONNECTIONS

THE HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

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

## ROVVER EXPLORES HAWAII

By Juli Kobayashi & Gail Ikeda, Hawaii LTAP

In our Fall 2004 issue, we featured an article on the Rovver® 600, a robotic remote imaging tool. The Rovver is a self-propelled, remotely operated motorized crawler that has the ability to inspect pipes with diameters ranging from 2 to 36 inches. Since that time we have been corresponding with **Amit Armstrong** from the Western Federal Lands Highway Division on bringing the Rovver to Hawaii for a demonstration. Our request was fulfilled and we are pleased to have introduced this technology to all our counties.

Our first demonstration began on Monday, June 13, 2005 where representatives from the City & County of Honolulu and the Hawaii Department of Transportation were invited to a briefing on the Rovver. **Amit Armstrong** and **Bradley Roberts** with the Western Federal Lands Highway Division gave a presentation of the Rovver. Sample video footage of the Rovver used in different states was shown and the participants had an opportunity for a hands-on demonstration.

The next day, attendees met at an arranged site in Aiea to see how the Rovver worked in the field. Participants took turns maneuvering the Rovver through a concrete culvert and were surprised to discover a manhole that was paved over.

Following Oahu, the Rovver traveled to Maui for a one day session where County of Maui and State representatives had an opportunity to see a presentation and a hands on demonstration. They were able to view the Rovver at a location in the Wailuku baseyard. They discovered a 4x4 wooden post partially blocking the outlet which had

to be manually removed. **Edwin Emoto**, County of Maui Wailuku District Supervisor said, "The Rovver was a good demo. We gave it our all. This is good for inspecting our culverts that are too small to send men through or even larger ones."

(Continued on Page 5)



*Brad Roberts introduces the Rovver to participants in the field.*

# IMPROVING SIGNALIZED INTERSECTIONS

By Joe G. Bared, FHWA Office of Safety Research and Development

FHWA's new guide will help State and local agencies plan, design, and install appropriate facilities to improve safety and traffic operations for all users.



This intersection features lane-aligned signal heads (one signal head for each lane of traffic), with dual left-turn lanes, two through lanes, and a right-turn lane.

According to 2002 data compiled by the National Highway Traffic Safety Administration, 21 percent of crashes and 24 percent of all fatalities and injuries related to motor vehicle collisions occurred at signalized intersections. Research conducted by the Federal Highway Administration (FHWA), however, has shown that under the right circumstances installing traffic signals can reduce the number and severity of crashes. But signals that are not designed appropriately can have an adverse effect on safety, so traffic managers need to design, place, and operate them carefully.

Because traffic signals play a key role in enhancing safety, FHWA recently produced a comprehensive handbook that explains methods to evaluate the safety and operation of signalized intersections and that highlights tools to remedy deficiencies. *Signalized Intersections: Informational Guide* (FHWA-HRT-04-091) provides information and tools that can help traffic engineers, project managers, and other transportation professionals conduct insightful assessments of intersections and understand the tradeoffs from potential improvement measures.

"The state of the art of intersection engineering has been greatly enhanced over the past 10 years, and what the guide does is deploy this new knowledge," says **Fred Ranck**, a safety design engineer at the FHWA Resource Center, who has taught workshops on intersection design

and operation.

The guide includes examples of innovative treatments and best practices used by jurisdictions across the United States. These examples include low-cost measures such as improving signal timing and signs, and more expensive measures such as reconstructing intersections or grade separations. Although some treatments apply only to high-volume intersections, the guide provides solutions relevant to the entire range of traffic volumes.

The guide takes a holistic approach to signalized intersections and considers the safety and operational implications of a particular treatment on all system users, including motorists, pedestrians, bicyclists, and transit users. Also covered are intersection fundamentals, analysis methods, and solutions to intersection deficiencies.

"None of us learns in school how it is in the real world—where the tire hits the road, so to speak—so the guide provides that information," says **Thomas Hicks**, director of the Maryland State Highway Administration's Office of Traffic and Safety and a member of the committee that reviewed the guide. "You can read in a textbook about reaction time and how wide a lane should be, but the guide puts all the pieces together in terms that reflect what drivers actually see as they drive through an intersection."

## Intersection Basics

Designing signalized intersections begins with knowledge of the fundamentals of road user needs, geometric design, and traffic design and illumination, all covered in separate chapters of the guide.

Road users, such as motorists, bicyclists, and pedestrians, are the operative players in the road system, and their perceptions and decisions affect their performance. In the 1980s, FHWA's Human Factors team began applying human factors-based knowledge to the design of roadways and signage. Termed *positive guidance*, the concept focuses on understanding how road users—primarily motorists—acquire, interpret, and apply information while driving.

(Continued on Page 3)

## IMPROVING SIGNALIZED INTERSECTIONS

(Continued from page 2)

The concept of positive guidance is simple: If drivers are provided with the information they need in a format they can read, understand, and react to in a timely fashion, then the chances of driver error will be reduced and safety will be improved.

“The idea is to give motorists the information they need at the time they need it,” says FHWA’s **Ranck**. “Intersections are complex meetings of roads, so it is crucial for the driver to get the right information as to what lane to be in and where to go.”

Traffic engineers apply knowledge of road user needs by designing and operating signalized intersections that inherently convey to various users what to expect. This information reinforces common expectations or communicates alternative information if uncommon elements are present, such as an emergency vehicle running a red light, allowing sufficient time for drivers to react.



A well-designed signalized intersection can improve traffic safety and mobility. Pavement markings, like those shown in this overhead photo, can be used to delineate travel lanes within wide intersections.

Article reprinted with permission from Department of Transportation—Federal Highway Administration, *Public Roads*, January/February 2005.

## NEW HAWAII PEDESTRIAN SAFETY LAW

By Lee Nagano, HDOT Hwy-V / Safe Community Office



**T**o prevent pedestrian fatalities and injuries in Hawaii, Lieutenant Governor James “Duke” Aiona recently signed the pedestrian bill into law. The new law went into effect on May 25, 2005.

The new law strengthens the old law that required drivers to yield to pedestrians. The new law requires drivers to stop if a pedestrian is on the driver’s half of the roadway or when the pedestrian is approaching from the opposite

side of the roadway and is so close as to pose an immediate danger. When executing a right turn, drivers must stop for pedestrians in your half of the roadway.

The new pedestrian law covers all crosswalks, both mid-block and traffic controlled. Violators of the pedestrian law will receive a \$97 citation.

Here are a few safety tips for drivers:

- Stay focused and alert for sudden pedestrian movement when driving.
- Watch for pedestrians crossing multi-lane streets as they may be obstructed by a stopped car until in front of you.
- Be alert when visibility is poor as most pedestrian fatalities occur at dawn and dusk.

Remember: we are all pedestrians when we get out of our cars.

## NEWS FROM OUR PARTNERS...

### Steve Fong Scholarship Golf Tournament 2005

The **Hawaii Asphalt Paving Industry (HAPI)** and the **Cement and Concrete Products Industry (CCPI)** are again jointly working together to put on the 2005 Golf Tournament in memory of a very special individual, **Steve Fong**. The first event was held in August 2003 and was so well received, the Industry and Agencies wanted to do it again in 2005!



**Steve Fong** was an Engineer with the Federal Highway Administration as well as a past President of CCPI, who passed away in March of 2002 after a long illness. Those of you that knew Steve, and had been exposed to the “Fong Treatment” can relate to what this man was like and why he was so special. Steve would always test your knowledge and decision-making abilities, all for his hope of making better engineers and, most importantly, better people. Hawaii’s transportation engineers, governmental agencies, HAPI & CCPI, both wanted to pay tribute to the memory of this Engineer, **Steve Fong**, by doing this special event.

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.

The 2005 Golf Tournament will be held:

- Date: Thursday, August 18, 2005
- Place: Pearl Country Club
- Time: 11:00 am Registration; 12:30 pm Shotgun starts
- Format: 3-person modified scramble
- Cost: Individual Entry - \$120  
Corporate/Tee Sponsor Entry - \$500  
Awards Dinner Only - \$20
- Deadline: July 16, 2005 or first 144 players
- Contacts: Keith Takekawa (HAPI) Phone 682-3141  
Wayne Kawano (CCPI) Phone 848-7100  
Randy Matsumoto (HAPI) Phone 842-3227



# ROVVER DEMONSTRATED IN HAWAII

(Continued from page 1)



A participant takes an opportunity to controlling the Rovver.

bilities of the Rovver and even tried to persuade Mr. Armstrong to leave it on Kauai.

The best part of this demonstration series is that we will be able to borrow the Rovver for use, free of charge upon availability. We received a positive response from all the counties and hope to bring the Rovver back to Hawaii for further cost effective and safe assessments of existing structures.

Next stop, the Big Island, where the Rovver had an opportunity to show participants from the County and State how well it works. Each participant had the chance to have a hands on experience handling the Rovver through the 24" concrete culvert. The site that they visited was being repaired and they could view the contractor's progress in real time.



The Rovver going underwater to investigate a culvert on Kauai.

Finally, the Rovver went to Kauai and it was used to investigate the condition of a pipe where a section of pavement on a residential road had collapsed. The Rovver was able to show its ability to adapt to different conditions by going underwater to view the damage. The participants were very impressed with the capa-

Contact information:  
**Amit Armstrong, Ph.D., P.E.**  
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## HIGHWAY FACTS

Hawaii Motor-Vehicle Registrations (2003)  
 Information from the Federal Highway Administration Office of Highway Policy Information

	Motor Vehicles			Total
	Automobiles	Buses	Trucks	
Private and Commercial	517,814	3,623	364,450	885,887
Publicly Owned *	7,463	1,217	8,343	17,023
<b>Total</b>	<b>525,277</b>	<b>4,840</b>	<b>372,793</b>	<b>902,910</b>

\*Includes Federal, State, county, and municipal vehicles. Vehicles owned by the military services are not included.

## WEBSITES AND RESOURCES

### Work Zone Safety

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#### Federal Highway Work Zone Administration Mobility and Safety Program

[www.ops.fhwa.dot.gov/wz/](http://www.ops.fhwa.dot.gov/wz/) contains information on:

- Best Practices
- Construction Strategies
- Contracting Strategies
- Intelligent Transportation Systems and Technology
- Outreach and Training
- Performance and Measurements
- Regulation and Policy
- Work Zone and Traffic Analysis/Management

#### Federal Highway Work Zone Administration Office of Safety

[safety.fhwa.dot.gov/wz/](http://safety.fhwa.dot.gov/wz/) contains information on:

- Facts and Statistics
- National Highway Work Zone Safety Program
- Planning and Design
- Speed Management
- Policy and Guidelines
- Community Programs and Resources

#### Federal Highway Work Zone Administration Office of Safety, Roadside Hardware

[safety.fhwa.dot.gov/roadway\\_dept/road\\_hardware/](http://safety.fhwa.dot.gov/roadway_dept/road_hardware/) contains information on:

- Frequently Asked Questions
- Policy, Regulations and Guidance
- Nighttime Visibility of Signs
- Manufacturers
- Workshops and Training
- Ongoing Research
- Hardware Acceptance Letters

#### National Work Zone Safety Information Clearinghouse

[wzsafety.tamu.edu](http://wzsafety.tamu.edu) contains information on:

- Crash statistics
- Laws and Regulations
- Equipment and Technology
- Public Education and Outreach Programs
- Research Publications
- Standards and Specifications
- Federal and State Practices
- Training Programs
- Key Experts

### Transportation

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#### Bureau of Transportation Statistics

[www.bts.gov](http://www.bts.gov)

BTS is a policy, objective broker for facts compiled from independent data collection covering all modes of transportation.

#### CIA World Fact Book, Central Intelligent Agency

[www.cia.gov/cia/publications/factbook/index.html](http://www.cia.gov/cia/publications/factbook/index.html)

The CIA World Factbook provides information on all countries worldwide. There is a description of the various modal transportation systems by country. Information includes miles of highway (both paved and unpaved), number and description of airports, mileage of railways, and information on maritime, and pipeline transportation.

#### FirstGov

[firstgov.com](http://firstgov.com)

FirstGov is the only official U.S. Government portal to millions of pages of government information, services, and on-line transactions. This site provides both a topic and search engine to federal, state, and local government information.

#### Government Resources

<http://www.hawaii.gov/portal/>

A good listing of federal, state, local and county resources.

#### Highway Statistics, Federal Highway Administration

[www.fhwa.dot.gov/ohim/ohimstat.htm](http://www.fhwa.dot.gov/ohim/ohimstat.htm)

The Highway Statistics Series consists of annual reports containing analyzed statistical data on motor fuel, motor vehicles, driver licensing; highway-user taxation, state and local government highway finance, highway mileage, and federal aid for highways.

#### Statistical Abstracts

[www.census.gov/statab/www/](http://www.census.gov/statab/www/)

The National Data Book contains a collection of statistics on social and economic conditions in the United States.

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## WEBSITES AND RESOURCES

### Thomas

[thomas.loc.gov](http://thomas.loc.gov)

U.S. Congress' website contains the status and full text of all bills, congressional reports, and public laws.

### U.S. Gazetteer, U.S. Census Bureau

[www.census.gov/cgi-bin/gazetteer](http://www.census.gov/cgi-bin/gazetteer)

This gazetteer is used to search and view maps of locations through the Tiger Map Server (which allows zooming in and out for more detailed maps). The gazetteer also provides census data on locations.

### Online Manuals

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#### Building Safer Highway Work Zones: Measures to Prevent

[www.cdc.gov/niosh/2001128.html](http://www.cdc.gov/niosh/2001128.html)

Worker injuries from Vehicles and Equipment (NIOSH)

#### Manual on Uniform Traffic Control Devices (FHWA)

[mutcd.fhwa.dot.gov](http://mutcd.fhwa.dot.gov)

#### Work Zone Related Crashes: Challenges and Opportunities for Prevention (NIOSH)

[www.cdc.gov/niosh/docs/2003-119/](http://www.cdc.gov/niosh/docs/2003-119/)

### Training

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#### APWA Educational Page

[www.apwa.net/education/](http://www.apwa.net/education/)

#### LTAP Program

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

#### National Highway Institute

[www.nhi.fhwa.dot.gov/](http://www.nhi.fhwa.dot.gov/)

Extensive listing of courses. Web based training available.

#### National Transportation Library

[www.ntl.bts.gov](http://www.ntl.bts.gov)

The National Transportation Library (NTL) currently has over 12,000 full text reports available through its website. It offers browsing by topic and is searchable. The library also offers a reference service and access to group catalog of major transportation libraries. TRIS Online is also available through NTL.

### Research in Progress

[rip.trb.org](http://rip.trb.org)

The Research in Progress (RIP) now has over 8,000 records of on-going or recently completed projects. The RIP database contains projects from state departments of transportation, the Federal Highway Administration, and Federal Transit Administration. International research projects are now being added to Transportation Research Information Services (TRIS).

### Transportation Research Board (TRB)

[www.trb.org/](http://www.trb.org/)

### Transportation Research Information Services (TRIS) Online

[www.ntl.bts.gov/tris](http://www.ntl.bts.gov/tris)

Transportation Research Information Services (TRIS) Online is the web version of the TRIS Database. TRIS Online is available from the Bureau of Transportation Statistics' National Transportation Library website. It includes the entire TRIS Database except for Research in Progress and ITRD (International Transportation Research Documentation) records. Currently, TRIS Online has over 450,000 records of published transportation research. Links are being developed to the full text electronic documents or document suppliers.

### Turner Fairbank Highway Research Center, FHWA

[www.tfhrc.gov](http://www.tfhrc.gov)

The Turner Fairbanks Highway Research Center (TFHRC) website provides information on current research at the TFHRC center in the areas of intelligent transportation systems, pavement structures, human factors and traffic operations. Information on current projects and full text of some research reports are provided. The full texts of the journals Public Roads and Research Technology Transporter are available online.

*Adapted with permission from the Technology Transfer Quarterly, May 2005, Florida Transportation Technology Transfer (T2) Center.*

## THE NEW AND IMPROVED HIPERPAV II

**M**eet the improved and expanded version of the Federal Highway Administration's (FHWA) HIPERPAV (Hlgh PERformance PAVing) software. As in the first version of the software, HIPERPAV II provides guidance on the design and construction of concrete pavements and helps users anticipate and prevent pavement performance problems. HIPERPAV II also incorporates guidelines for the proper selection of design and construction variables to minimize early-age damage to jointed plain concrete pavement (JPCP) and continuously reinforced concrete pavement (CRCP). In addition, the software can be used to determine the effect of early-age behavior factors on the long-term performance of JPCP. The new version also provides the capability to optimize concrete mix designs to meet specific performance criteria and predict early-age behavior of dowel bars in rigid pavements.

*Computer-Based Guidelines for Concrete Pavements*, in a three-volume series detailing the creation of HIPERPAV II. Volume I (Publication No. FHWA-HRT-04-121) provides a project summary, while Volume II (Publication No. FHWA-HRT-04-122) contains the HIPERPAV II User's Manual. Volume III (Publication No. FHWA-04-127) presents the technical appendixes, which document the investigation, modeling, and validation of the software. Volumes I and II are available online at [www.tfhr.gov/pavement/pccp/hipermain.htm](http://www.tfhr.gov/pavement/pccp/hipermain.htm).

The software and Volume III of the Guidelines will be posted online at [www.tfhr.gov/pavement/pccp/hipermain.htm](http://www.tfhr.gov/pavement/pccp/hipermain.htm). For more information, contact **Fred Faridazar** at FHWA, 202-493-3076 (email: [fred.faridazar@fhwa.dot.gov](mailto:fred.faridazar@fhwa.dot.gov)).

The software's accompanying documentation,

*Reprinted from FHWA's Focus, June 2005.*

## 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. **FHWA-RD-89-146** - Structural Overlay Strategies for Jointed Concrete Pavements, Vol. VI: Guidelines for the Selection of Rehabilitation Alternatives
2. **FHWA-RD-89-166** - Fatigue Cracking of Steel Bridge Structures, Vol. 1: A Survey of Localized Cracking in Steel Bridges-1981 to 1989
3. **FHWA-RD-89-167** - Fatigue Cracking of Steel Bridge Structures, Vol. 2: A Commentary and Guide for Design, Evaluation, and Investigation of Cracking
4. **FHWA-RD-89-193** - Soil Nailing for Stabilization of Highway Slopes and Excavations
5. **FHWA-RD-90-017** - 1989 NCP Annual Progress Report, Executive Summary
6. **FHWA-RD-90-019** - Moisture Damage in Asphalt Mixtures--A State-of-the-Art Report
7. **FHWA-RD-90-074** - Horizontal Curves for Two-Lane Rural Roads
8. **FHWA-RD-90-082** - Evaluation of the Supplemental Procedure of the Maximum Specific Gravity Test for Bituminous Paving Mixtures
9. **FHWA-RD-90-103** - Operational Impacts of Wider Trucks on Narrow Roadways
10. **FHWA-RD-90-110** - Performance Evaluation of SEA Pavements
11. **FHWA-RD-90-91** - Application of New Accident Analysis Methodologies, Vol. I: General Methodology
12. **FHWA-SA-91-003** - Breakaway Timber Utility Pole Installations in Kentucky
13. **FHWA-SA-91-033** - Sign Fabrication, Installation, and Maintenance--Innovative Practices
14. **FHWA-SA-91-043** - The Cone Penetrometer Test
15. **FHWA-SA-92-010** - Design of Bridge Deck Drainage
16. **FHWA-SA-92-042** - An Evaluation of Granular Overlays in Washington State
17. **FHWA-SA-93-001** - Roadway Delineation Practices Handbook
18. **FHWA-SA-93-006** - Local Low Volume Roads and Streets
19. **FHWA-SA-93-025** - Guidelines for Design, Specification, and Contracting of GeoSynthetic Mechanically Stabilized Earth Slopes on Firm Foundation
20. **FHWA-SA-93-026** - Recommendations Clouterre 1991
21. **FHWA-SA-93-049** - Highway/Utility Guide
22. **FHWA-DP-96-001** - Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges
23. **FHWA-OP-01-030** - Rural ITS Solutions: Rural ITS Toolbox

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

### 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 -  
[www.eng.hawaii.edu/~hltap/video.html](http://www.eng.hawaii.edu/~hltap/video.html)

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

Website:  
[www.eng.hawaii.edu/~hltap/](http://www.eng.hawaii.edu/~hltap/)

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



## Director's Note

by C.S. Papacostas



Region 5 (Midwest) joined Regions 9 and 10 (Western, including Hawaii) for their annual regional meeting at Reno, Nevada on June 7-8.

We'd like to thank **Maria Ardila-Coulson**, Nevada LTAP Director, as well as **Lisa Cody-Goade** and **Larry Lunz** of her staff for organizing an excellent event with internal LTAP interchanges, technical presentations and field trip.

We were also happy to see FHWA Nevada Division Administrator **Susan Klekar** whose previous assignment was in Hawaii. Susan was a strong supporter of our program and was instrumental in organizing the very successful first (1999) Traffic Safety Forum in Honolulu.

The Nevada Department of Transportation (NDOT) has an inventory of 13,000 roadway miles of which 28% are classified as low-volume. It is, therefore, critical for them to identify cost-effective maintenance methods. To this end, NDOT is examining numerous test sections under local conditions that range from desert to alpine.

Along the Reno-Carson City segment of I-580, NDOT is currently constructing the Galena Creek Bridge, which at a span of 1700-ft is the longest arch bridge in the Western hemisphere. Four web cameras provide continuous information to the public and have resulted in valuable benefits in claim avoidance, defense and resolution by providing equal access to all parties.

Other major projects include a design-build project to replace a surface rail line with a depressed facility in Reno (ReTrac), restoring water channels crossing roadways to their natural courses, using of weather stations and processing software on a wireless network to improve winter maintenance activities, and minimizing the contribution of roadways to non-point source pollution.

With regard to internal LTAP affairs, the next thrust appears to be toward "Level 2 and 3" evaluations which attempt to measure the level of retention and the degree to which what is learned at LTAP workshops is in fact implemented in the field.

## Program Manager's Note

by Juli Kobayashi



There are several exciting events that we are looking forward to bringing to Hawaii in the next few months. The first is our annual **Superintendents/Overseers Conference** in Kailua, Kona. The exchange of information and ideas is the key component to this very significant activity and we are looking forward to another successful conference. Camaraderie is also crucial and the participants develop a strong bond after it is over. They return to their counties and are able to contact one another for issues that affect their jobs and offer solutions to the problems.

Following the conference, we are coordinating a course with the FHWA Hawaii Division office entitled, "**Introduction to Systems Engineering for Advanced Transportation**". This course is for Intelligent Transportation Systems (ITS) project managers and staff. The objective of this course is to have the participants understand the benefits of applying systems engineering approaches as a means of developing quality transportation systems.

At the end of the year, we have the 2 week "**Safety Inspection of In-Service Bridges**" course that offers participants with the training requirements of the National Bridge Inspection Standards (NBIS). There will be mid-term and final examinations based on the course content which will qualify and certify the participants to become bridge inspectors.

Another significant workshop that we are organizing with the Hawaii Department of Transportation (HDOT) and FHWA Hawaii Division is the **Accelerated Construction Technology Transfer (ACTT) Workshop**. This workshop addresses the need to shorten construction time on highways which inevitably cuts costs and the exposure of workers to traffic. Using national transportation leaders to identify resourceful techniques, strategic planning, and technologies, the ACTT process has proven to be a viable approach to addressing the construction time and traffic congestion concerns. To find out more information on each of these workshops, please check our website at: [www.eng.hawaii.edu/~hltap/](http://www.eng.hawaii.edu/~hltap/).

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



In this issue, we are featuring the island of Moloka'i, known as the "Friendly Isle". The official flower of Moloka'i is the white Kukui blossom (see left). On the cover is **Halawa Beach** located on the eastern tip of Moloka'i and on the back is the **Kalaupapa Trail** (a.k.a. Mule Trail).

## HAWAII LTAP ACTIVITIES

Compiled by Gail Ikeda, Hawaii LTAP

The first half of 2005 is over! Our second quarter started off with the "Drilled Shaft Foundation Inspection" workshop. This NHI (National Highway Institute) course was developed to provide a basis for local, regional, or national qualification of drilled shaft foundation inspectors. The course provided the inspectors with practical knowledge and standard industry practices for the inspection of drilled shaft foundation construction. After two days of classroom work, the participants were administered a two-hour qualification exam. Following the examination was a site visit of a drilled shaft foundation in progress. The site visit, which was arranged by **Domingo Galiciano** of the FHWA Hawaii Division, gave the participants an opportunity to practice what they learned in the classroom. Instructors, **Naresh Samtani** and **Peter Osborn** commented that of all the times they taught this course they never had the opportunity to take participants to a field visit.

We worked together with **Jodi Chew** from the FHWA Hawaii Division, to organize two environmental workshops. The first was a one-day overview of the National Environmental Protection Act (NEPA). **Carol Adkins**, an En-



vironmental Protection Specialist in the FHWA Office of Project Development, shared her knowledge about NEPA and other environmental regulations such as the Endangered Species Act and the Clean Water Act. The second was a three-day session entitled, "Linking Planning and Environment". This session, lead by **Louise Smart** and **Julie McKay** of CDR Associates, encouraged lively discussions among invitees of the Hawaii Department of Transportation (HDOT) about the planning process.

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

## HAWAII LTAP NEWS

By Kevin Kuba, Hawaii LTAP

From disarming bombs to traversing Mars' surface, robots have proven themselves invaluable in our ever demanding lives. Students at the University of Hawaii at Manoa have been working on LEGO robots that navigate their way through a complex maze. Each robot is also capable of overcoming obstacles and performing other tasks while completing the maze. These



rover-like robots must first accept a random infrared signal and travel through its corresponding gate. After climbing a set of stairs, the robots must then accurately place a small plastic cylinder in the center of a target (laid flat on the table). Finally, each robot must battle with another robot to reach the finish line. These opposing robots are programmed to prevent the other robot from finishing the maze, using any means necessary. Using nothing but simple LEGO pieces and their own ingenuity, these mechanical engineering students have developed robots that adapt to their surroundings and autonomously find their way through the maze. The lesson behind the competition taught the students not only the programming language, but also structural design (stability, strength, power, maneuverability, speed, etc.), teamwork, and creativity. Hopefully these LEGO robots will spark an interest for these upcoming engineers as well as bring back those fond childhood memories, just playing with LEGOs.



# HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

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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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