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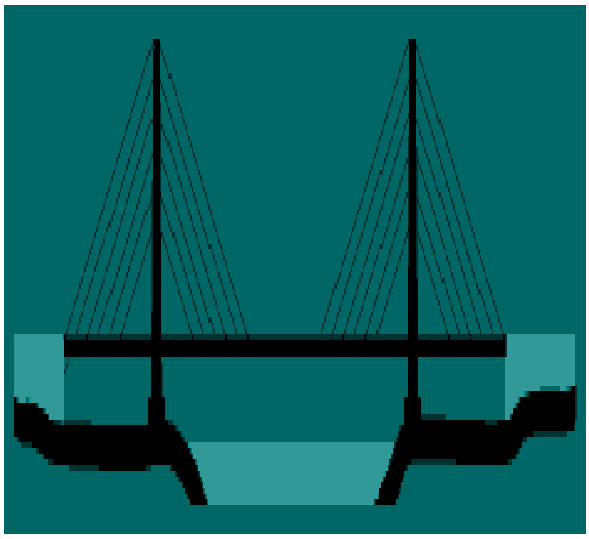
First Cable-Stayed Bridge in Puerto Rico

In October 2004, Puerto Rico drivers, specially those from the municipality of Naranjito, will be able to cross La Plata River through the new and first cable-stayed bridge in the island. This type of bridge was created to be more efficient than a suspension bridge. The main difference between a suspension bridge and a cable - stayed bridge is that the first, is sustained by cables which are all connected to a principal cable, and the second, consists of a main span which is sustained by columns of stressed cables. This last feature, not only creates a more stiff structure, but it also allows the principal cables of the large cross section to be replaced by a group of cables or steel elements of a reduced cross section, and therefore obtain a lighter structure.



A scale model of the Cable-Stayed Bridge proposed in Naranjito.

Continued on Page 2

Continued from page 1

In This Edition…

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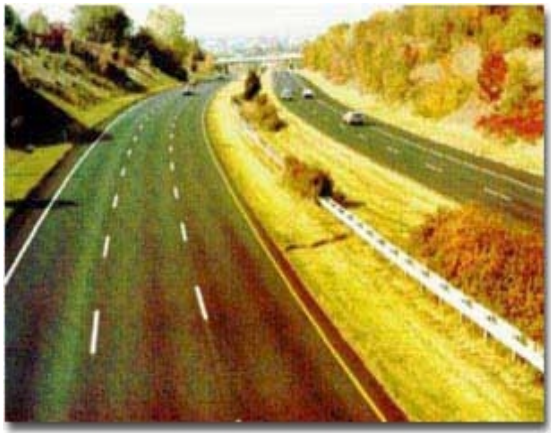
This project, located on road PR-148 at Naranjito, consists on the construction of a 320 meters long bridge having a main span of 160 meters to cross el La Plata River sideways without affecting the natural condition of the stream. The structure will have a cross section of 29.20 meters in order to accommodate four lanes of 3.65 meters, two shoulders of 3.00 meters and a division barrier of 1.80 meters. The two main columns will have a diamond shape with a height of 82 meters. The bridge will have a conventional and aesthetical illumination system. This system intends to allow people to contemplate and enjoy the structure from different scenic areas, specially from road PR-167. The project, estimated at $27.7 millions, was designed by CSA Architects and Engineers in consortium with HNTB Architects, Engineers, and Schedulers, and will be constructed by L.P. C. & D Inc.

New Test Methods to Improve the Quality of Hot Mix Asphalts Mixtures

The National Center for Asphalt Technology (NCAT), located at Auburn University in Alabama, has developed new test methods to characterize and improve the quality of Hot Mix Asphalt (HMA) mixtures. This article briefly describes four (4) of these methods.



1. Ignition Test for Asphalt Content

This method was developed to determine the asphalt content of HMA mixtures. The ignition test consists of heating the HMA mixture to a temperature about 1000˚F in order to ignite and burn off the asphalt binder. This test method was adopted by ASTM (D6307) and AASHTO (T308).

2. Automated Aggregate Gradation Device

The recovered aggregate from the ignition test is subjected to sieve analysis to determine its gradation. Since the conventional sieve analysis is time consuming, NCAT found an automated equipment to determine the aggregate's gradation.
This method consists on:

- Pouring the aggregate into the device, which shakes it on the desire sieves.
- Determine the retained weight on all sieves.
- Brushes each sieve
- Calculates the gradation with the help of a computer software

3. Field Permeability Test

Superpave use coarse-graded mixtures with relative larger maximum nominal sizes than those used in most of HMA mixtures. Due to the fact that some of the mixtures used in Superpave started to exhibit permeability problems, some State Departments of Transportation (DOT) decided to specify higher compaction levels and/or permeability tests on pavements core samples. For that reason, NCAT developed a field permeability device to determine permeability problems of Superpave, so this predicament can be detected and controlled during construction time.

Continued on Page 4

Continued from page 3

4. Workability of HMA

Based up on experience, suppliers of polymer-modified asphalt binders recommend mixing temperatures usually without any rational testing of the mixtures. Unfortunately, these decisions often results in unusual high mixing temperatures, which may not be needed. For that reason, there was a need to develop a device to quantify and establish the workability and mixing temperatures of HMA. Since workability is influenced by gradation, the aggregate and binder type, NCAT has developed a prototype workability device in discerning the effects of these components on workability.

These new test methods will be useful to the Puerto Rico Highway and Transportation Agency (PRHTA) in the process of implementing Superpave mixtures. In fact, such process is currently been used in a construction project of highway PR - 5 located in the municipality of Bayamón.

For additional information, you may access www.eng.auburn.edu/center/ncat/, or contact Eng. Orlando Díaz Quirindongo, Chief of Materials Testing Office of PRHTA at Minillas South Building, 11th floor, or call (787) 729-1592.

** Adapted from Asphalt Technology News*

Renewing TEA– 21

The Transportation Equity Act for the 21st Century (TEA-21) increased financial support for highways and transportation by 40%, with a budget of $219 billion, and guaranteed that tax revenues collected in the Highway Trust Fund would be used for improvements in transportation related projects. This legislation expires on September 30, 2003. The legislation that will reauthorize our surface transportation program for the next several years is the third iteration of the transportation legislation established by the Congress in 1991 with the Intermodal Surface Transportation Efficiency Act (ISTEA) and renewed in 1998 through TEA-21 and it is referred to as TEA - 3.

Continued on Page 5

Continued from page 4

Four of the major challenges for TEA-3 that provide an important framework for the renewal of TEA-21 are summarized below:

1. Require Accountability & Reward Performance

Eventhough TEA-21 represented over a 40% increase in federal funding for transportation programs, there has not been a similar improvement in performance because traffic congestion continues to increase, streets and sidewalks are in need of repair, pedestrian fatality and injury rates remain high, and transportation related smog still contributes to asthma and many health problems. TEA-3 must require that the state and local transportation agencies keep track of transportation performance measures, such as: public health, social equity, and environmental aspects. Performance assessment and funding are a must to both success and failure.

2. Fix it First

TEA-3 must contain a strong "Fix it First" stipulation to prioritize maintenance, operations and efficiency over new construction. This task should be accomplished since interstate system is approaching its middle age, and therefore, local streets, bridges, and sidewalks are in need of repair.

3. Create More Choices & Build Livable Communities

Surveys performed by state and federal agencies have shown that people demand better travel choices in order to create a more balanced transportation system. An ideal system should include real alternatives based essentially on an equal distribution of investments in mass transit, walking, bicycling, roads, and communities trails. TEA-3 must provide planning and funding tools to better coordinate transportation with land use, and use new incentives to create affordable housing, jobs, and recreational areas closer to mass transit, which should result in more choices, livable communities and a better quality of life.

4. Learn to Serve People

Transportation planning and its priorities must more follow both the intent and spirit of Title VI of the Civil Rights Act and the 1990 Americans with Disabilities Act (ADA). With TEA-3, public involvement should go far beyond the traditional comment period at public meetings to more effective ideas, such as providing community planning grants to neighborhoods, and the creation of non-profit groups to help them identify problems and design solutions. Transportation agencies should also reform significantly their practices to include a broader range of community outcomes.

In summary, TEA-3 must ensure more institutional accountability, performance-based outcomes, environmental and health protections, repair and maintenance guarantees, public involvement, and better transportation choices for all citizens.

**Adapted from www.tea3.org*

Tips for Making Intersections Safer

In the year 2001, there where approximately three million accidents reported at intersections; which resulted in 8500 fatalities and millions in injuries.

A recent study on roadway accidents shows that the reasons for crashes overlap. The study suggests that driver factors were involved in 93% of crashes, roadway aspects were in 34% of the accidents, and vehicle malfunctions caused 12% of crashes. Some of the most common driver mistakes on intersections are:

- To overestimate the time of the yellow light signal
- Underestimating the time to make a complete stop
- After a turn on an intersection, he or she underestimates the time to accelerate to an adequate speed.

A study was conducted in eight states to determine the main reasons for intersection accidents to occur. In conclusion, it showed in that 85% occurred at junctions where drivers used no directional signals; a little less than 75% were multiple-vehicle accidents in whose left turns were involved in 46.7%, and right turns in only 2.3%. This study indicates that placing directional signals at intersections cuts and reduces crashes by as much as 10 to 1.

State and Local Transportation Agencies should adopt tools that can assist decision makers in the process of addressing the intersection safety problem. Examples of such tips are listed below:

- Install STOP AHEAD sign
- Increase the size of signs from 30" to 36" .
- Install overhead intersection flashing-red beacon with illumination
- Install flashing-yellow indications through road.
- Use wise engineering judgment to select, design, install, operate and maintain traffic control devices.
- Use statistics to identify high crash zones and improve them.
- Use Intelligent Transportation Systems (ITS) technology. This includes controllers and detectors, as well as audible pedestrian signals.

Several tools have been developed that can assist to solving the problem at intersections. Four (4) of these initiatives are described below:

1. AASHTO Strategic Highway Safety Plan

The goal of this strategic highway safety plan is to improve the country's present and predicted statistics on vehicular related death and injuries. The principal elements of this plan are:

- drivers
- special users
- vehicles
- highways emergency medical services
- management

2. Project 17-18(3) FY 2000: Guidance for Implementation of the AASHTO Strategic Highway Safety Plan

This project was envisioned to assist state and local highway agencies to develop guidance for implementing strategies to reduce fatalities by 10 to 15% in aggressive driving, number of drivers with suspended and revoked license, hazardous trees that need to be relocated, and intersections without semaphores nor adequate and yet necessary transit signals.

3. Outreach Toolkit

This kit consists on a set of sheets addressed to the community to communicate how important it is to be aware and understand the existing safety problems at intersections. This package includes facts, issues and possible solutions for intersection safety problems. This kit will be available at FHWA and ITE website.

4. Intersection Safety Video

The video entitled *Red Light, Green Light*, was designed to create consciousness on the critical importance of increasing safety at intersections. With this video, people will be able to identify steps to improve their safety while driving. It also provides information about what are the transportation professionals doing in order to create safer intersections.

For information on signs and other guidelines, consult the Federal Highway Administration's (FHWA) Manual of Uniform Traffic Control Devices (MUTCD) or visit the web page www.fhwa.dot.gov

**Adapted from Better Roads,2000*

Future

Events

March 19-22, 2003
AGC's 84th Annual Convention / Constructor Exposition
Honolulu, Hawaii
Tel. (703) 548-3118,
info@agc.org
www.agc.org

March 21, 2003
Highway Inspection
Arecibo, PR
Contact: Puerto Rico Institute of Civil Engineers College of Engineers and Surveyors of Puerto Rico
Tel. (787) 758-2250
www.ciapr.org

April 1-3, 2003
Escambia County Pavement Preservation Program Showcase
Pensacola, Florida
Contact: Chris Ritch
Local Technical Assistance Program
Tel. 352.392.2371 ext. 223
www.ltap2.org

June 1-5, 2003
Bridges and Structures Annual Meeting
Albuquerque, New Mexico
Contact: Tony Kane
Tel. (202) 624-5800,
akane@aashto.org
www.nmshtd.state.nm.us/Bridge/

July 27 –31, 2003
2003 National LTAP and TTAP Conference
Honolulu, Hawaii
Contact: Hawaii Local Technical Assistant Program
http://www.eng.hawaii.edu/~hltap/

The Center's staff welcomes your questions and suggestions. To contact the Center, please send all correspondence to the following address:

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Departamento de Transportación Y Obras Públicas

US Department of Transportation
Federal Highway Administration

Gobierno de Puerto Rico

Autoridad de Carreteras Y Transportación