Module 3:
Every Day Counts Initiative in Puerto Rico

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April 11, 2016

30 Years of Excellence in the Training of Transportation Officials at Municipal, State and Federal Level in Puerto Rico and the United States Virgin Islands

Good Afternoon!

Acronyms

- EDC – Every Day Counts
- FHWA – Federal Highway Administration
- T^2 Center – Puerto Rico Transportation Technology Transfer Center
- USVI – United States Virgin Islands

Agenda

- Part I
  - The Role of the Puerto Rico T^2 Center in the EDC Implementation in Puerto Rico
- Part II – EDC Initiatives in Puerto Rico
  - EDC 1 | 2011-2012
  - EDC 2 | 2013-2014
  - EDC 3 | 2015-2016
- Part III – EDC Safety Initiatives
  - Safety Edge
  - Traffic Incident Management
  - Smarter Work Zones

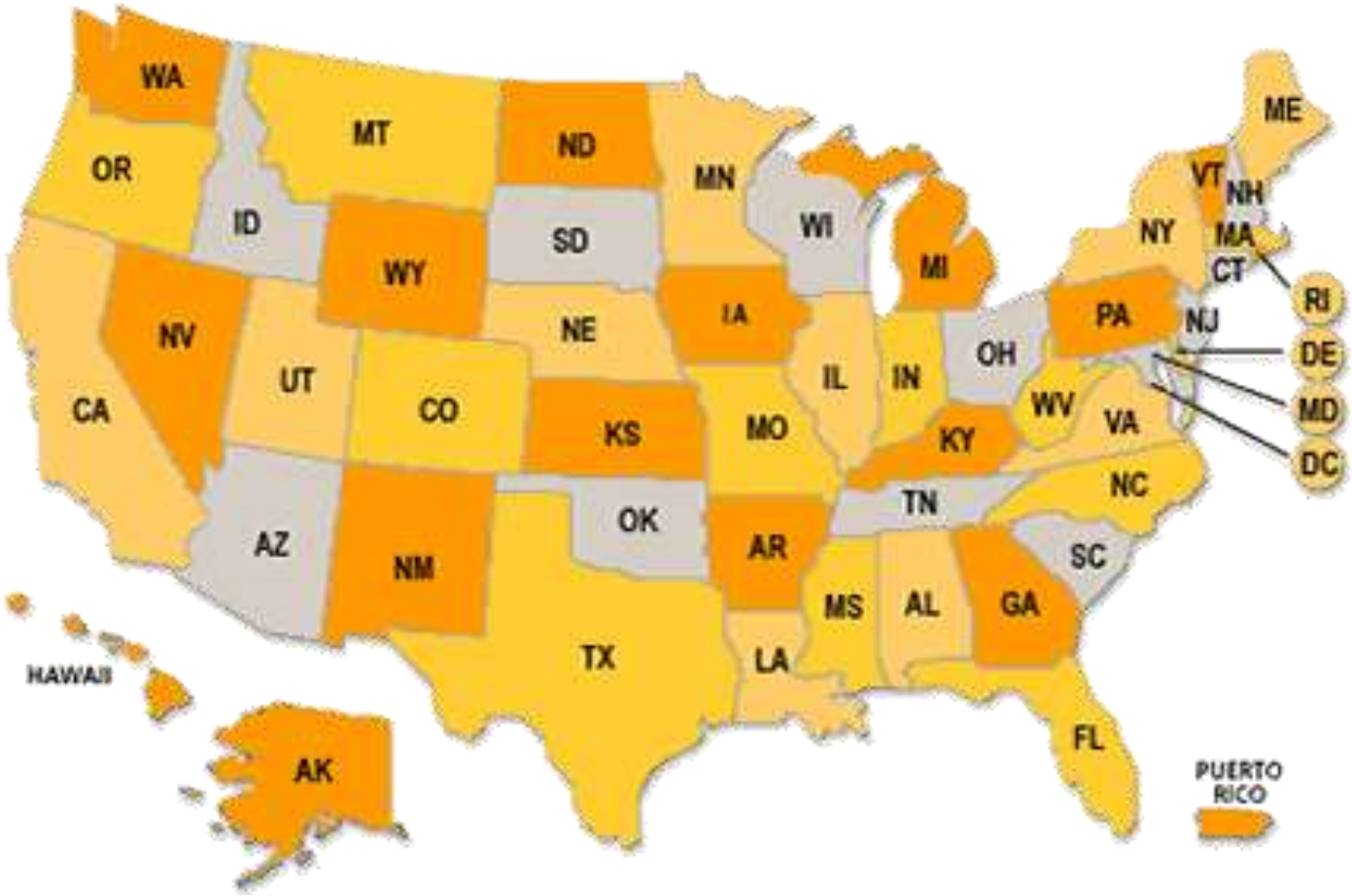
Part I: The Role of the Puerto Rico T² Center in the EDC Implementation in Puerto Rico

Puerto Rico Transportation Technology Transfer Center

T² - El Centro - Puerto Rico LTAP

- Established in 1986
- Civil Engineering and Surveying Department of the University of Puerto Rico, Mayagüez Campus
- Funded by:
  - Puerto Rico Department of Transportation and Public Works (DTPW)
  - US Virgin Islands Department Public Works (DPW)
  - Local Technical Assistance Program(LTAP), FHWA

Current Network of T²/LTAP Centers



51 LTAP Centers (PR and USVI T² Center) and 7 Tribal (TTAP) Centers :

1. East Mississippi
2. Colorado
3. California
4. North Valleys
5. Alaska
6. North East
7. Oklahoma

- ARTBA Clearinghouse (www.artba.org)

T² Center Objectives

- Provide technical assistance to municipalities and local transportation agencies on current and emerging technology.
- Provide information regarding planning, design, construction, evaluation, maintenance and operation of highway transportation infrastructure facilities
- Emphasis on safety, infrastructure management, workforce development and organizational excellence.




Every Day Counts (EDC) Initiatives

- Is a national federal program designed to identify and deploy innovation in strategic areas aimed at
  - ✓ shortening project delivery,
  - ✓ enhancing the safety of our roadways, and
  - ✓ protecting the environment.
- The DOT's have the responsibility to implement this national innovative program.
- The coverage of the EDC national program includes the 50 states, Washington D.C., Puerto Rico and the USVI.

EDC and the 4 I's

1. Innovation
2. Ingenuity
3. Invention
4. Imagination

" ...EDC deployment is a Calculated Educated Risk"

Gregg Nadeau
FHWA Deputy Administrator
December 14, 2010
Atlanta, GA

The Role of Puerto Rico LTAP in the EDC Initiatives

1. Assisting in the EDC Implementation Plan of the Department of Transportation and Public Works (DTPW) of the Government of Puerto Rico.
2. Serving as a technical oversight of each EDC.
3. Assisting in the development of training modules.
4. New training resources.
5. Provided technical assistance to undergraduate and graduate students to work on EDC research projects.

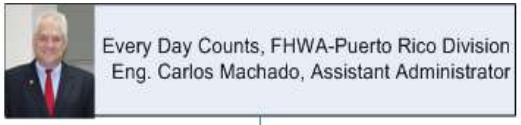
Part II: EDC Initiatives in Puerto Rico

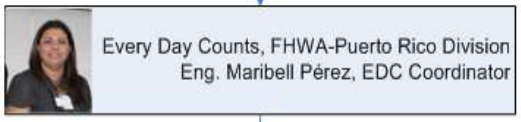
EDC 1 Initiatives for Puerto Rico

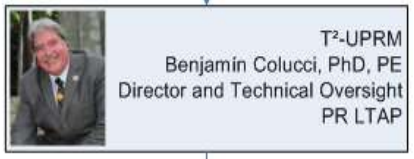
EDC 1 (2011-2012)

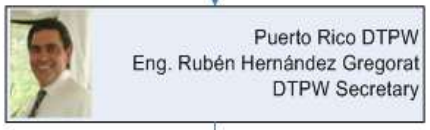
- Warm – Mix Asphalt (WMA)
- Safety Edge
- Geosynthetic Reinforced Soil (GRS-IBS)
- Prefabricated Bridge Elements & Systems (PBES)
- Adaptive Signal Control Technologies (ASCT)
- Enhanced Technical Assistance on Stalled EISs
- Flexibilities in Right of Way (ROW)
- Flexibility in Utility Relocation

EDC 1 Management and Implementation Structure: Commonwealth of Puerto Rico









- Warm Mix Asphalt (WMA)
- Flexibility in Right of Way (FROW)
- Prefabricated Bridge Elements (PBES)
- Enhanced Technical Assistance on Stalled EISs
- Adaptive Signal Control Technology (ASCT)
- Safety Edge (SE)
- Flexibilities in Utility Relocation (FUR)
- Geosynthetic Reinforced Soil (GRS)
- Design Build (DB)

- Warm Mix Asphalt (WMA)
- Safety Edge (SE)
- Flexibility in Right of Way (FROW)

EDC 1 Puerto Rico Champions

	EDC Initiative	PRHTA Champion	E-mail
1	Warm-Mix Asphalt	Eng. Juan C. Bonet Materials Engineer	jbonet@act.dtop.gov.pr
2	Safety Edge	Eng. Ana L. Torres Construction Management Engineering	antorres@dtop.gov.pr
3	Prefabricated Bridge Elements & Systems	Eng. Héctor Laureano Special Assistant to the PRHTA Executive Director	hlaureano@dtop.gov.pr
4	Geosynthetic Reinforced Soil	Eng. Héctor Laureano Special Assistant to the PRHTA Executive Director	hlaureano@dtop.gov.pr
5	Design Build	Eng. Héctor Laureano Special Assistant to the PRHTA Executive Director	hlaureano@dtop.gov.pr
6	Adaptive Signal Control Technologies	Eng. Cándido Camacho Director, Traffic Operations Area	ccamacho@dtop.gov.pr
7	Enhanced Technical Assistance on Stalled EISs	Eng. Carmen G. Alicea Chief of Environmental Studies Office	calicea@dtop.gov.pr
8	Flexibilities in Right of Way	Atty. Aarón Hernández Right of Way Manager	alhernandez@dtop.gov.pr
9	Flexibility in Utility Relocation	Eng. María Marcano Utilities and Illumination Office Active Chief	mmarcano@dtop.gov.pr

EDC 2 Initiatives for Puerto Rico

EDC 2 (2013-2014)

- Intelligent Compaction
- Accelerated Bridge Construction
- Programmatic Agreements
- National Traffic Incident Management
- Implementing Quality Environmental Documentation

EDC 2 Puerto Rico Champions

	EDC Initiative	PRHTA Champion	E-mail
1	Intelligent Compaction	**Eng. José M. López**	jolopez@dtop.gov.pr
2	Programmatic Agreements	**Eng. Carmen G. Alicea**	calicea@dtop.gov.pr
3	ABC / PBES	**Eng. Héctor Laureano**	hlaureano@dtop.gov.pr
4	Implementing Quality Enviromental Documentation	**Eng. Carmen A. Morales**	cmorales@dtop.gov.pr
5	National Traffic Incident Management Training	**Eng. Samuel Forestier**	sforestier@act.dtop.gov.pr

EDC 3 Management and Implementation Structure: Commonwealth of Puerto Rico

Every Day Counts, FHWA-Puerto Rico Division
Eng. Mike Avery, Assistant Administrator

Every Day Counts, FHWA-Puerto Rico Division
Eng. Maribell Perez, EDC Coordinator

PRLTAP - T^2-UPRM
Benjamin Colucci, PhD, PE
Director and Technical Oversight

Puerto Rico Highway and Transportation Authority
Eng. Carmen Villar
Executive Director

Puerto Rico Highway and Transportation Authority
Eng. Zulma Marín
Office of Federal Liaison

- Smarter Work Zones
- Geosynthetic Reinforced Soil (GRS) & Integrated Bridge Elements (IBS)
- Road Diets
- Implementing Quality Environmental Documentation

EDC 3 Initiatives for Puerto Rico

EDC 3 (2015-2016)

- Intelligent Compaction
- Accelerated Bridge Construction
- Programmatic Agreements
- National Traffic Incident Management
- Implementing Quality Environmental Documentation

Accomplishments of the Puerto Rico LTAP related to EDC in Puerto Rico and USVI

1. Participated in Train the trainer course related to Model Systems Engineering Documents for Adaptive Signal Control Technology (ASCT) Systems, January 2012.
2. Participated in the preparation of the 1st ConOps report that is required by FHWA-HOP-11-027 report dated August 2011, in terms of developing Model Systems Engineering Documents and implementing to ASCT, February to June 2012.
3. Extended our partnerships with Purdue University and the Joint Transportation Research Program (JTRP), and his Director, Dr. Darcy Bullock, to continue collaborating in training and technology transfer aspects associated with the implementation of ASCT in Puerto Rico and USVI.

Accomplishments of the Puerto Rico LTAP related to EDC in Puerto Rico and USVI (Cont.)

4. The Center expanded liaison with private partners, Betteroads and Robles Asphalt, among others, that assisted in the implementation of Warm Mix Asphalt and Safety Edge in Puerto Rico and the US Virgin Islands.
   - On-going laboratory research on binder modification.
   - Additives:
     - Sasobit
     - Evotherm M1
     - Kaoamin 14
     - Rediset

Accomplishments of the Puerto Rico LTAP related to EDC in Puerto Rico and USVI (Cont.)

5. EDC has expanded our **network of collaboration** with **state and federal administrative agencies** such as:
   - **"Instituto de Cultura Puertorriqueña" (ICP)** – Arq. Belford Matías Maldonado and Glorilyn Olivencia.
   - **"Oficina de Gerencia de Permisos" (OGPe)** – Eng. Jaime Green, Director of the Environmental Evaluation and Compliance Division; Rosa Otero and Luis Morales.
   - **State Historic Preservation Office (SHPO)** – Marinés Colón González, Historic Property Specialist.
   - **United States Army Corps of Engineers (USACE)** – Eng. Sindulfo Castillo, Chief of the Antilles Regulatory Section.
   - **United States Fish and Wildlife Service (US FWS)** – Dr. José Cruz Burgos, Biologist.
   - **Puerto Rico Planning Board (JP)** – Geo. María del C. Gordillo, Vice-President.
   - **Puerto Rico Highway and Transportation Authority (PRHTA)** – Eng. Carmen Alicea, Chief of the Environmental Studies Office

Accomplishments of the Puerto Rico LTAP related to EDC in Puerto Rico and USVI (Cont.)

6. Publication of our bilingual quarterly newsletter "El Puente", hardcopy and electronic version, editions with feature articles associated with EDC Success Stories in Puerto Rico and USVI.
7. Major changes in the Center webpage that incorporate EDC as well as our involvement in safety related initiative endorsed by USDOT and FHWA, namely, Decade of Action for Road Safety: 2011-2020 and Toward Zero Death (TZD).

EL PUENTE

Newsletter of the Puerto Rico Transportation Technology Transfer Center
University of Puerto Rico, Mayagüez Campus
Volume 27, Number 3, 2013

This edition is the eighth of a series that focus on the implementation activities of EVERY DAY COUNTS (EDC) in Puerto Rico and the U.S. Virgin Islands.

Launch of the State Transportation Innovation Council (STIC) in Puerto Rico

The Administrator of the Federal Highway Administration (FHWA), Eng. Víctor Méndez, visited Puerto Rico on Thursday, October 24, 2013, in order to announce the launch of the State Transportation Innovation Council (STIC). The STIC is a concept developed by the FHWA, which promotes innovation and cooperation between representatives of the transportation industry at federal and state level, and the public and private sector to working together for the development and implementation of new technologies in transportation projects.

Continued in page 3

IN THIS EDITION

Puerto Rico LTAP

The Puerto Rico Transportation Technology Transfer Center is part of a network of 58 Centers through the United States that comprises the Local Technical Assistance Program (LTAP) and the Tribal Technical Assistance Program (TTAP), which enable local governments, countries and cities to improve their roads and bridges by supplying them with a variety of training programs, an information clearinghouse, new and existing technology updates, personalized technical assistance, and newsletters.

El Puente Publications

Relation of EDC with the Strategic Highway Safety Plan

- The safety research component within the UPRM UTC project is synchronized with the objectives of the recently adopted 5 year Strategic Highway Safety Plan (SHSP): 2014-2018
  - Approved by the Puerto Rico Highway and Transportation Authority (PRHTA) with FHWA funding match of $32 million/year.

SAFER SIM
SAFETY RESEARCH USING SIMULATION
UNIVERSITY TRANSPORTATION CENTER

Accomplishments of the Puerto Rico LTAP related to EDC in Puerto Rico and USVI (Cont.)

8. Created a Facebook page in the internet to document the success stories and promoting EDC related activities.
9. Preparation of a database program to manage all EDC related reports.
10. Keep training our staff in new emerging technologies associated to EDC related disciplines.
11. Collaboration with professional organizations such as Puerto Rico ITE by promoting pertinent research studies associated to EDC.

Institute of Transportation Engineers
ite
Puerto Rico Section

Part III – EDC Safety Initiatives

1. Safety Edge

Benefits

- Has the potential to save lives allowing drivers who drift off highways to return to the road safely.
- Provides a strong, durable transition for all vehicles. Even at higher speeds, vehicles can return to the paved road smoothly and easily.

Verifying the 30° safety edge angle at paving project, Yabucoa, PR

1. Safety Edge (Cont.)

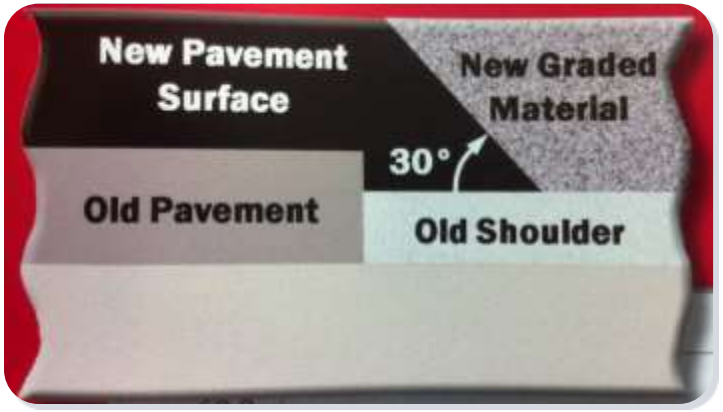
Tasks Performed

- Acquisition of the Advant-Edge Model Ramp Champ and TransTech: Shoulder Wedge Maker (FHWA loan program).
- Selection of candidate paving projects to implement safety edge technology.
- Preparing the screed unit of the paver for the installation of safety edge devices.
- Layout of experimental plan for safety edge and density measurements.
- Train undergraduate and graduate students on the installation and measurements requirements for the safety edge experiment.

1. Safety Edge (Cont.)

On-going Phase in Safety Edge

- Verify the integrity of safety edge in experimental segments in the highway network in Puerto Rico
- Approve safety edge specifications
- Complete public policy of implementation of safety edge in Puerto Rico
- Develop training module on safety edge with the collaboration of FHWA and PR-LTAP (T^2)



1. Safety Edge (Cont.)

Advant-Edge Model Ramp Champ

TransTech: Shoulder Wedge Maker

1. Safety Edge (Cont.)

Tasks Performed: Betteroads Asphalt Corp. Patillas, PR

- Training maintenance crew on the installation of TransTech: Shoulder Wedge Maker and Advant-EDGE: Ramp Champ on paver screed unit

Laydown and Compaction, Patillas, PR- Betteroads Asphalt Corp. (June 24, 2011)

Advant-EDGE: Ramp Champ

- The shoes can be detachable to create a tapered Safety Edge or a longitudinal center lane joint
- The slope of the Safety Edge can be adjusted from 5° to 30°
- The ramp champ is reversible and can be used for either the left or right side

Advant-EDGE: Ramp Champ Components

Height Adjusting Screw

Radial Force Cylinder
Produces downward and inward force on the shoe creating a stronger edge

Mounting Plate
Remains fixed and is bolted to the screed

Wedge
Designed to form different slope angles and allows it to change with the elevation of the adjacent road shoulder

Cotter Pin
Removal of piece is necessary to remove box from plate

Cover Plate
Protects inner adjustment elements from dirt and asphalt

Box
The box contains a slope set screw where the slope of the angle can be adjusted

Shoe
Produces either a tapered safety edge or a longitudinal center lane joint

Advant-EDGE: Ramp Champ Installation Protocol

Clear debris on the screed unit of the paver

Place a 1" shim at the bottom of the screed

Remove cotter pin and place the mounting plate on top of the shim

Start drilling the screed unit with a 1/2" drill bit

Place mounting plate onto screed unit. Insert and tighten a bolt and washer

Reattach the box to the mounting plate and reinsert the cotter pin

TransTech: Shoulder Wedge Maker

- Creates a tapered shoulder wedge.
- Typically used in a match pair, one for the right side and one for the left side of the paver.
- Needs adjusting to keep the bottom of the edge in contact with the shoulder surface.

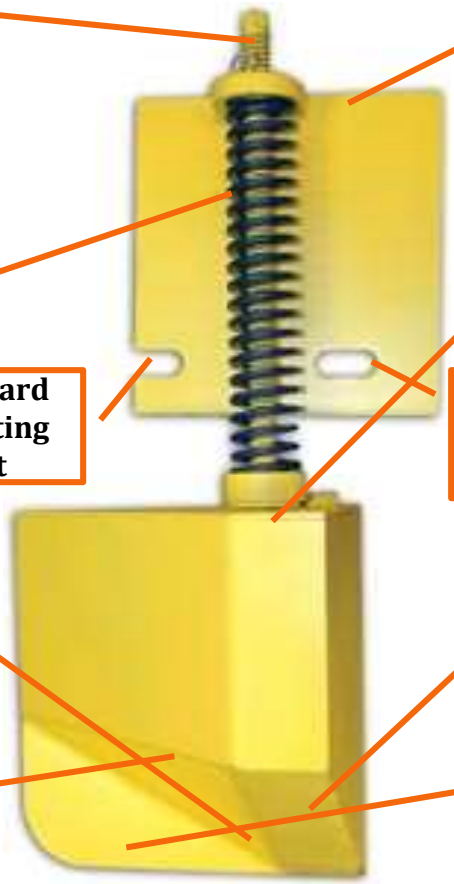
TransTech: Shoulder Wedge Maker Components

Adjusting Screw
Sets the height of the SWM and when adjusted, creates a downward force to keep the device in contact with the surface

Self-adjusting Internal Spring
Provides a downward force to keep the guide rail in connection with the surface

½" Radius Leading Edge
Provides a smooth transition from the asphalt being extruded under the SWM

45° Compound Angle Surface
Forces asphalt mix under the device and increases compaction of the wedge fillet



Outboard Mounting Slot

Inboard Mounting Slot

Mounting Plate

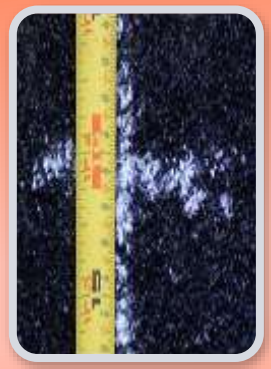
Cover Plate
Protects the inner adjustment elements from any dirt or asphalt that may enter

30° Forming Edge
Extends below the screed strike-off plate and extrudes the fillet at the given angle

Guide Rail with a 2"radius
- Allows the SWM to ride along the surface of the shoulder
- The 2"radius allows for better transitions between obstacles

Shoulder Wedge Maker Installation Protocol

Clear debris on the screed unit of the paver



Measure and mark the location for the two mounting holes

Drill a 1/2" diameter hole in each marked location

Remove cotter pin and position plate over mounting holes

Insert a 1/2" bolt and washer into each mounting slot and tighten

Insert adjusting screw through the mounting plate and insert cotter pin

Safety Edge Job Site Location in 2013

Preliminary Data Analysis: Compaction and Safety Edge Angle Patillas, PR-Betteroads Asphalt Corp. (June 24, 2011)

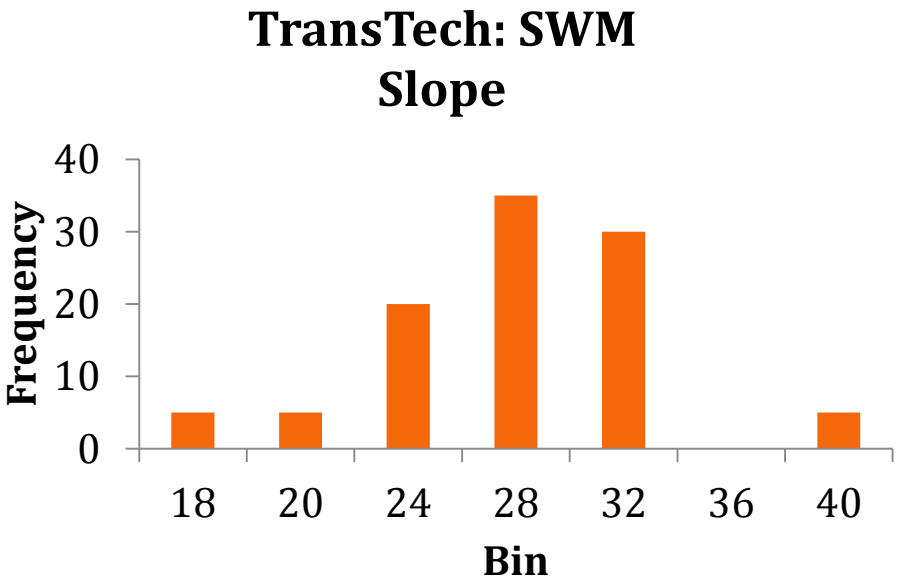
TransTech: Shoulder Wedge Maker

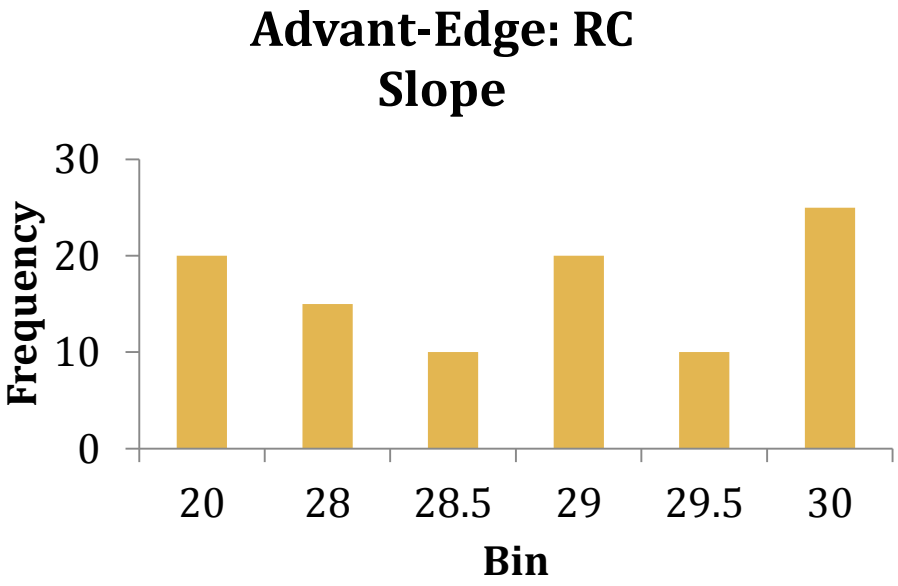
Variable	Mean	Std. Dev.	Coefficient of Variation	Minimum	Median	Maximum
% Compaction (%)	93.49	0.98	1.05	92.3	93.3	95.1
% Compaction (%)@ 1 ft.	82.90	2.56	3.09	78.2	83.1	86.8
Slope(°)	25.8	5.69	22.05	13.8	27.15	36.4

Advant-Edge: Ramp Champ

Variable	Mean	Std. Dev.	Coefficient of Variation	Minimum	Median	Maximum
% Compaction (%)	94.31	1.29	1.37	92.60	94.10	96.0
% Compaction (%)@ 1 ft.	83.60	3.38	4.04	79.10	85.20	87.40
Slope(°)	26.27	5.21	19.83	16.80	29.00	29.80

Preliminary Data Analysis: Safety Edge Angle
Patillas, PR-Betteroads Asphalt Corp. (June 24, 2011)





Tasks Performed

Robles Asphalt, Ponce, PR

- Training maintenance crew on the installation of TransTech: Shoulder Wedge Maker and Advant-EDGE: Ramp Champ on paver screed unit
- Laydown of Saturated Surface Dry Sand, Ponce, PR September 12, 2011

Laydown of Saturated Surface Dry Sand, Ponce, (September 12, 2011)

Implementation of Safety Edge in Puerto Rico Symposium

- December 2011 in Pachín Vicens Sport Complex facilities in Ponce, PR.
- Safety Edge Field Demonstration:
  - Collaboration of private sector, Robles Asphalt and Betteroads Asphalt.

Demonstration with sand

Message of the Editor of Newsletter El Puente Highlighting Safety Edge Demonstration Project in Ponce, PR

- *One of these successful Safety Edge demonstrations was conducted in December 2011 at the parking facilities of the Pachin Vicens Auditorium in the Municipality of Ponce, P.R.*
- *…The demonstration consisted of laying down a saturated surface dry sand simulating a surface asphalt mix, operating two pavers at the same time, each one with a different safety edge technology, namely TransTech: Shoulder Wedge Maker (SWM) and Advant-Edge: Ramp Champ (RC).*
- *…The unconditional collaboration of the Federal Highway Administration (FHWA), the Puerto Rico Highway and Transportation Authority (PRHTA), the Department of Transportation and Public Works of Puerto Rico and U.S. Virgin Islands, Betteroads and Robles Asphalt Corp., related to the Every Day Counts (EDC) initiatives is greatly appreciated.*

Dr. Benjamín Colucci

Volume 26, Number 1, 2012

Newsletter El Puente
Volume 24, Number 2-3, 2010

EL PUENTE

Boletín del Centro de Transferencia de Tecnología en Transportación
Recinto Universitario de Mayagüez, Universidad de Puerto Rico
Volumen 24, Número 02-03, 2010

www.uprm.edu/prt2/

En esta edición

Mejorando la Visibilidad del Marcado de Pavimento

Nueva propuesta con reglas para mantener el nivel mínimo de retroreflectividad en el marcado del pavimento.

El marcado del pavimento en carreteras y calles proveen a los usuarios información importante acerca de las regulaciones, advertencias o guías que no pueden ser obtenidas por el uso de otros dispositivos y suplementan otros dispositivos de control de tráfico, como semáforos, rótulos y otros marcados. La visibilidad del marcado puede limitarse por nieve, residuos y agua sobre o adyacente al marcado; mientras que la durabilidad del marcado se afecta por las características del material, el volumen de tráfico, el clima y la localización del mismo.

Propósito de la Propuesta de Revisión del Manual de Dispositivos Uniformes para el Control del Tránsito

Una Notificación de Propuesta de Enmiendas (NPE) fue publicada por la Administración Federal de Carreteras (FHWA, por sus siglas en inglés) el 22 de abril de 2010 en el Código de Regulaciones Federales (23 CFR 655) para añadir Estándares, Guías, Opciones e información de Apoyo con relación a mantener niveles mínimos de retroreflectividad en el marcado de pavimento en el MUTCD 2009. La revisión propuesta establece un nivel mínimo uniforme para el rendimiento del marcado de pavimento basado en la necesidad de visibilidad nocturna de los conductores, para promover la seguridad vial, mejorar la operación del tráfico, y facilitar la comodidad y conveniencia de todos los conductores, incluyendo aquellos de edad avanzada. Las revisiones propuestas serán designadas como la Primera Revisión del MUTCD 2009.

Nuevos recursos en nuestra biblioteca:

- AASHTO. 2010. Highway Safety Manual.
- FHWA. 2010. Traffic Monitoring: A Guidebook. Report FHWA-WFL/TD-10-002.
- FHWA. 2010. Modern Roundabouts: A Safer Choice. CD-ROM FHWA-SA-10-023.
- FHWA. 2009. Comprehensive Intersection Resource Library. CD-ROM FHWA-09-027.

El Centro de Transferencia de Tecnología de Transportación de Puerto Rico es parte de una red de 58 centros a través de los Estados Unidos que compone el Programa de Asistencia Técnica Local (LTAP) y el Programa Tribal de Asistencia Técnica (TTAP), que permite a los gobiernos locales, condados y ciudades, mejorar sus carreteras y puentes mediante el suministro de programas de capacitación, un centro de información, tecnologías nuevas y existentes, asistencia técnica personalizada y boletines informativos.

EL PUENTE

Newsletter of the Puerto Rico Transportation Technology Transfer Center
University of Puerto Rico at Mayaguez
Volume 24, Number 02-03, 2010

www.uprm.edu/prt2/

In this issue

Improving the Visibility of Pavement Markings

Proposal for new standards for maintaining minimum retroreflectivity levels of pavement markings.

Pavement markings on highways and streets provide to the road user important information about regulations, warning, or guidance that is not obtainable by the use of other devices, and supplement other traffic control devices, such as signs, traffic signals, and other markings. The visibility of the markings can be limited by snow, debris, and water on or adjacent to the markings and the durability of the markings is affected by the material characteristics, traffic volumes, weather, and location.

Purpose of the Proposed Revision to the Manual on Uniform Traffic Control Devices

A Notice of Proposed Amendments (NPA) was published by the Federal Highway Administration (FHWA) in the Federal Register (23 CFR 655), on April 22, 2010, proposing to revise the MUTCD 2009 by adding Standards, Guidance, Options, and Support information related to minimum levels of retroreflectivity for pavement markings. The proposed revision establishes uniform minimum levels of nighttime pavement marking performance based on the visibility needs of drivers, to promote safety, enhance traffic operations, and facilitate the comfort and convenience for all drivers, including older drivers. The proposed revision described herein would be designated as Revision 1 to the 2009 Edition of the MUTCD.

(article continues in page 4)

New technical resources in our library:

- AASHTO. 2010. Highway Safety Manual.
- FHWA. 2010. Traffic Monitoring: A Guidebook. Report FHWA-WFL/TD-10-002.
- FHWA. 2010. Modern Roundabouts: A Safer Choice. CD-ROM FHWA-SA-10-023.
- FHWA. 2009. Comprehensive Intersection Resource Library. CD-ROM FHWA-09-027.

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Newsletter El Puente
Volume 25, Number 3, 2011

Newsletter El Puente
Volume 26, Number 1, 2012

EL PUENTE

Boletín del Centro de Transferencia de Tecnología en Transportación
Recinto Universitario de Mayagüez, Universidad de Puerto Rico

Volumen 26, Número 1, 2012

¡Alianza Exitosa!

SafetyEDGE

Historias Exitosas en Adiestramientos e Implantación de las Iniciativas EDC en Puerto Rico

CADA DIA CUENTA (EDC) es una iniciativa innovadora propulsada por la Administración Federal de Carreteras (FHWA) para ayudar a los Estados y Territorios a utilizar tecnologías y procedimientos innovadores para mejorar la seguridad de las carreteras, proteger el ambiente y acortar el tiempo de terminación de los proyectos.

El borde de seguridad (safety edge), suelos reforzados geosintéticamente/sistema integrado de tecnología de puentes y flexibilidades en el derecho de vía, son tres de las iniciativas innovadoras que actualmente se están implantando exitosamente en Puerto Rico y en las Islas Vírgenes.

A. Borde de Seguridad

El Borde de Seguridad es una solución eficaz y costo-efectiva para mitigar los accidentes relacionados al borde del pavimento. Cuando se construye correctamente, dando forma al borde del pavimento a 30°, (Continúa en la página 3)

Esta edición es la segunda de una serie dedicada a las actividades de implantación de las estrategias de EDC en Puerto Rico y en las Islas Vírgenes

EN ESTA EDICIÓN

El Centro de Transferencia de Tecnología de Transportación de Puerto Rico es parte de una red de 58 centros a través de los Estados Unidos que compone el Programa de Asistencia Técnica Local (LTAP) y el Programa Tribal de Asistencia Técnica (TTAP), que permite a los gobiernos locales, condados y ciudades, mejorar sus carreteras y puentes mediante el suministro de programas de capacitación, un centro de información, tecnologías nuevas y existentes, asistencia técnica personalizada y boletines informativos.

EL PUENTE

Newsletter of the Puerto Rico Transportation Technology Transfer Center
University of Puerto Rico, Mayagüez Campus

Volume 26, Number 1, 2012

Successful Partnership!

SafetyEDGE

Successful Stories in Training and Implementation of EDC Initiatives in Puerto Rico

EVERY DAY COUNTS (EDC) is an initiative of the Federal Highway Administration (FHWA) to assist states and territories to use innovative technologies and procedures to improve road safety, protect the environment and shorten the time of completion of the projects.

Safety Edge, Geosynthetic Reinforced Soil - Integrated Bridge System Technology and Flexibilities in the Right of Way are three of the innovative initiatives currently being successfully implemented in Puerto Rico and the US Virgin Islands.

A. Safety Edge

The Safety Edge is an effective and cost-effective solution to mitigate pavement edge-related crashes. When constructed correctly, shaping the edge of the pavement to thirty degrees (30°) can eliminate the problem (Continued on page 3)

This edition is the second in a series that focus on the implementation activities of EVERY DAY COUNTS (EDC) in Puerto Rico and the U.S. Virgin Islands.

IN THIS EDITION

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Newsletter El Puente
Volume 26, Number 2, 2012

EL PUENTE

Boletín del Centro de Transferencia de Tecnología en Transportación
Recinto Universitario de Mayagüez, Universidad de Puerto Rico

Volumen 26, Número 2, 2012

Herramientas ABC: Un Solo Diseño y 10,000 Puentes

La Construcción Acelerada de Puentes (ABC, por sus siglas en inglés), es una forma de construir puentes en la que se utilizan métodos innovadores de planificación, diseño, materiales y construcción. Estos métodos nuevos de construcción se utilizan de una manera segura y costo efectiva. A su vez, reducen el tiempo total de construcción y ayuda a disminuir los impactos al tráfico contribuyendo a la seguridad de todos los usuarios.

El Programa Estratégico de Investigación en Carreteras (SHRP por sus siglas en inglés) desarrolló el SHRP 2 R04, en el que su objetivo es crear estándares de diseño, construcción y reusar sistemas completos de puentes que afiendan las necesidades apremiantes de reemplazo. A la misma vez, intenta integrar de una manera eficiente los equipos modernos para la construcción.

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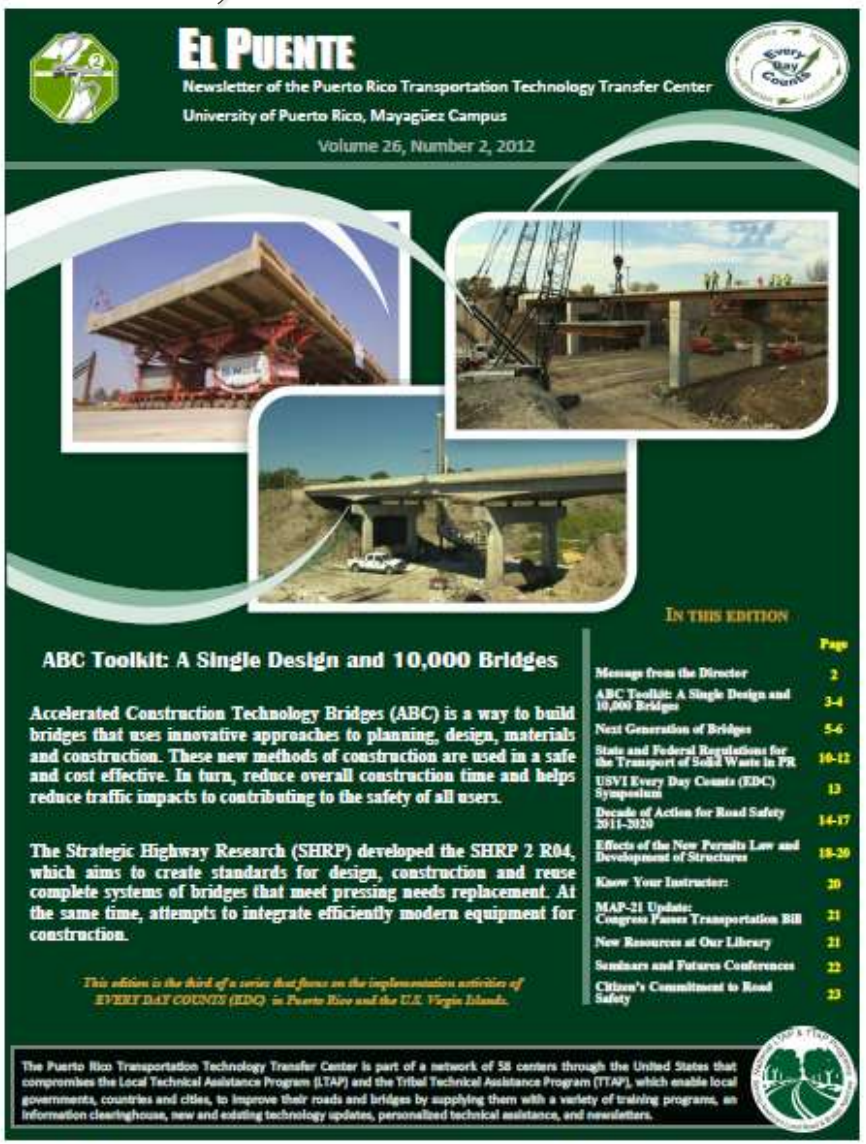

EL PUENTE

Newsletter of the Puerto Rico Transportation Technology Transfer Center
University of Puerto Rico, Mayagüez Campus

Volume 26, Number 2, 2012

ABC Toolkit: A Single Design and 10,000 Bridges

Accelerated Construction Technology Bridges (ABC) is a way to build bridges that uses innovative approaches to planning, design, materials and construction. These new methods of construction are used in a safe and cost effective. In turn, reduce overall construction time and helps reduce traffic impacts to contributing to the safety of all users.

The Strategic Highway Research (SHRP) developed the SHRP 2 R04, which aims to create standards for design, construction and reuse complete systems of bridges that meet pressing needs replacement. At the same time, attempts to integrate efficiently modern equipment for construction.

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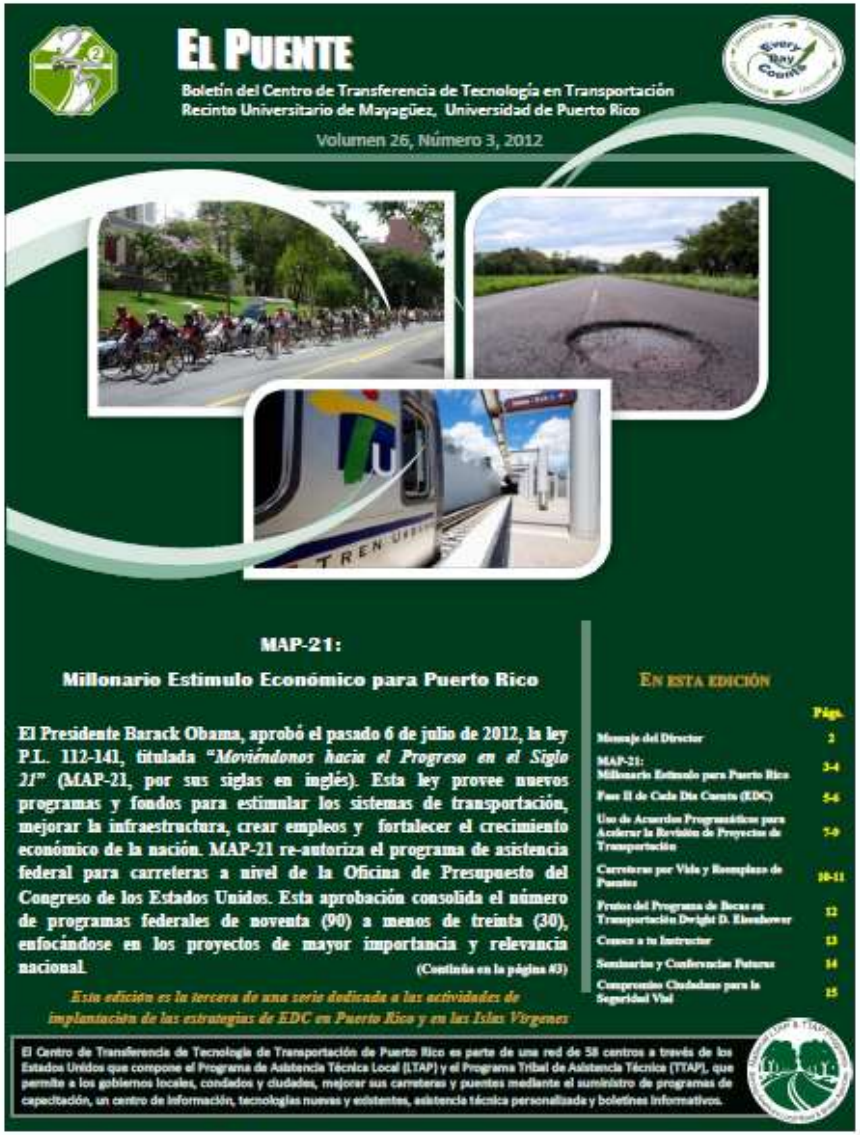
Newsletter El Puente
Volume 26, Number 3, 2012



EL PUENTE

Boletín del Centro de Transferencia de Tecnología en Transportación
Recinto Universitario de Mayagüez, Universidad de Puerto Rico

Volumen 26, Número 3, 2012

MAP-21:

Millonario Estimulo Económico para Puerto Rico

El Presidente Barack Obama, aprobó el pasado 6 de julio de 2012, la ley P.L. 112-141, titulada "*Moviéndonos hacia el Progreso en el Siglo 21*" (MAP-21, por sus siglas en inglés). Esta ley provee nuevos programas y fondos para estimular los sistemas de transportación, mejorar la infraestructura, crear empleos y fortalecer el crecimiento económico de la nación. MAP-21 re-autoriza el programa de asistencia federal para carreteras a nivel de la Oficina de Presupuesto del Congreso de los Estados Unidos. Esta aprobación consolida el número de programas federales de noventa (90) a menos de treinta (30), enfocándose en los proyectos de mayor importancia y relevancia nacional.

(Continúa en la página #3)

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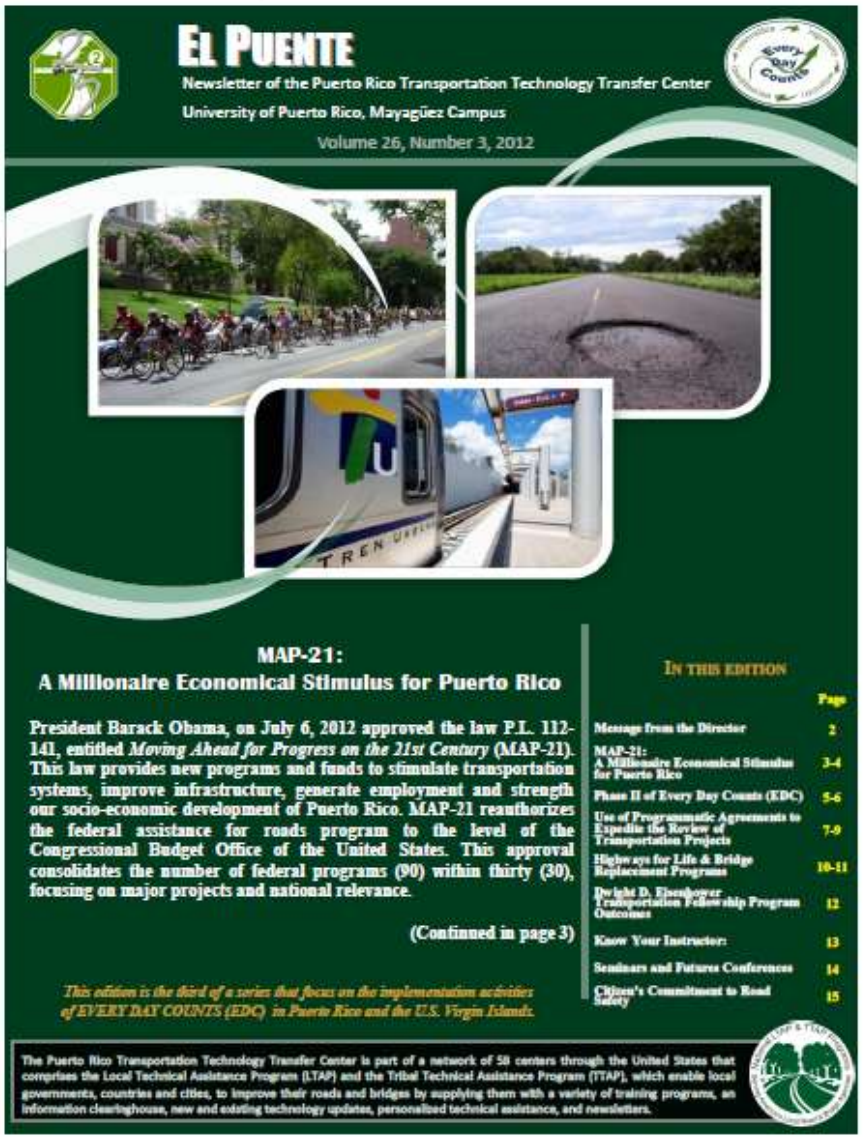

EL PUENTE

Newsletter of the Puerto Rico Transportation Technology Transfer Center
University of Puerto Rico, Mayagüez Campus

Volume 26, Number 3, 2012

MAP-21:

A Millionaire Economical Stimulus for Puerto Rico

President Barack Obama, on July 6, 2012 approved the law P.L. 112-141, entitled *Moving Ahead for Progress on the 21st Century* (MAP-21). This law provides new programs and funds to stimulate transportation systems, improve infrastructure, generate employment and strength our socio-economic development of Puerto Rico. MAP-21 reauthorizes the federal assistance for roads program to the level of the Congressional Budget Office of the United States. This approval consolidates the number of federal programs (90) within thirty (30), focusing on major projects and national relevance.

(Continued in page 3)

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Safety Edge Demonstration

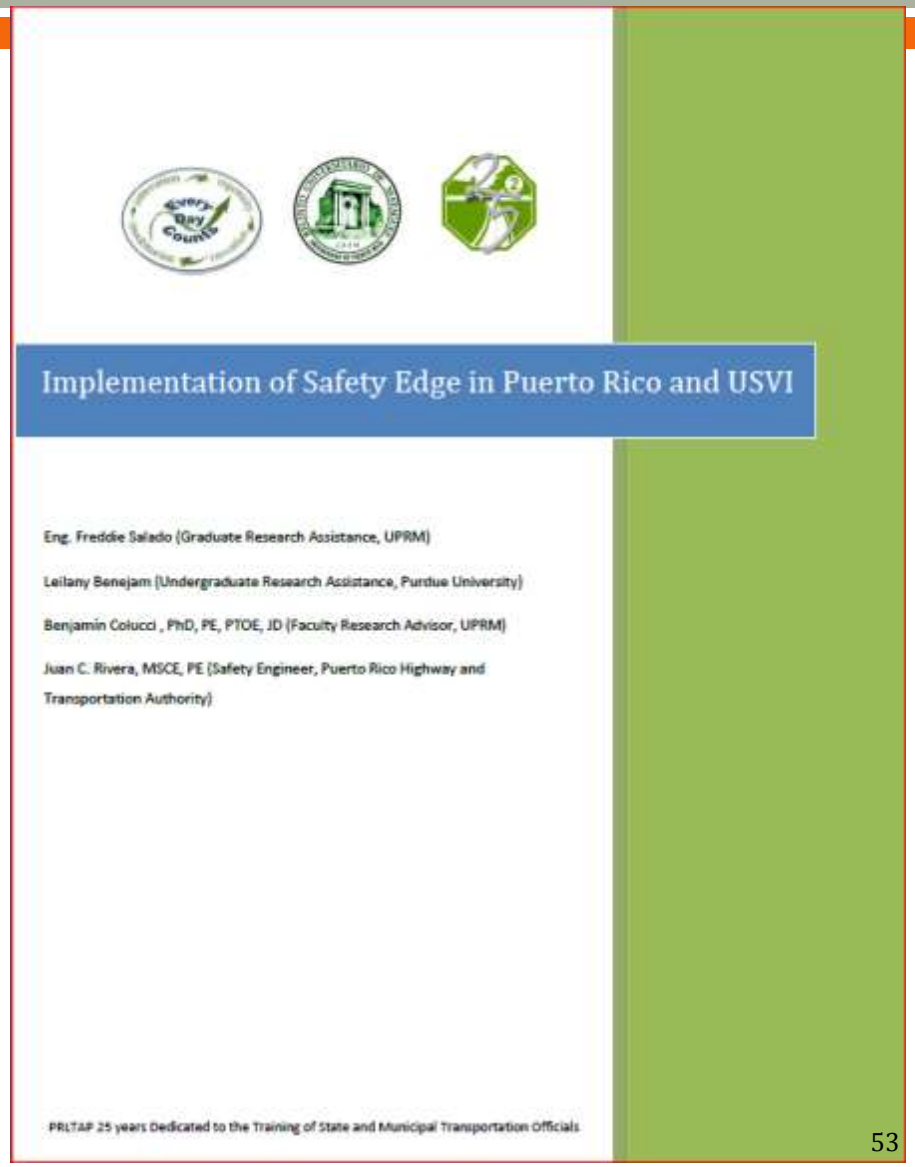
Safety Edge Training, Partnerships and Implementation in PR: A Success Story

Betteroads Asphalt

Robles Asphalt

Implementation of Safety Edge in Puerto Rico and USVI

- Submitted to Mark Sandifer, FHWA, Technology Deployment
- It specified the use and installation protocols for TransTech Shoulder Wedge Maker and Advant-Edge Ramp Champ in the implementation process of safety edge technology



Safety Edge Specifications

- *January 5, 2012:* FHWA issued the *"Safety Edge[SM] Design and Construction Guide"*. This guide provides standards, guides, and specifications for the use of this technology in the design and construction of all pavement projects in the United States and Puerto Rico.
- *January 6, 2012:* FHWA issued the *"Guide Specification for Safety Edge[SM]".* This document is intended to be used by the PRHTA in the implementation of Safety Edge[SM].

2. Traffic Incident Management (TIM)

- Traffic incidents, including crashes, disabled vehicles and debris on the road, create unsafe situations
- Put motorists, and responders' lives at risk
- And account for approximately **25%** of all traffic delays.

2. TIM (Cont.)

- For each minute that a freeway travel lane is blocked during peak use, an estimated 4 minutes of delay result after the incident is cleared
- This estimate accounts for 4.2 billion hours per year in delays
- Additionally, the U.S. Department of Transportation Strategic Plan Fiscal Year (FY) 2010 – FY2015 reports that Americans burn more than 2.8 billion gallons of gasoline every year while stuck in incident-related traffic.

2. TIM (Cont.)

- The TIM training for first responders promotes:
  - A shared understanding of the requirements for safe, quick clearance at traffic incident scenes;
  - Prompt, reliable and open communications
  - And motorist and responder safeguards
- Governors, transportation leaders and incident response agencies across the country can **save lives**, time and money by promoting the **full-scale deployment** of the innovative TIM training program.

2. TIM (Cont.)

- TIM training program focuses on a response effort that protects motorists and responders while minimizing the impact on traffic flow.
- TIM efforts includes
  - Detecting, verifying and responding to incidents
  - Clearing the incident scene
  - Restoring traffic flow.

2. TIM (Cont.)

Benefits

- Saving Lives
  - Better training leads to faster incident response and clearance
  - This means fewer secondary crashes result from the original incident and less exposure to moving traffic while the incident is resolved.
- Saving Money
  - In Atlanta, improved incident clearance practices reduced secondary crashes by 69% in 12 months, saving lives and more than $1 million.
- Saving Time
  - Well-trained responders can cut clearance time in half, decreasing delays caused by incident-related congestion.
  - Train-the-trainer courses help responders learn more quickly.

2. TIM (Cont.)

In Puerto Rico

- Second TIM Workshop
  - Held in march at the CIAPR in Hato Rey, San Juan
  - In collaboration with Metric Engineering of Puerto Rico, Department of Transportation and Public Works, Puerto Rico Highway and Transportation Authority and PR-LTAP
- Puerto Rico had 88 certified trainers who themselves have trained over 1,250 professionals from the emergency rapid response services

2. TIM (Cont.)

In Puerto Rico (Cont.)

2. TIM (Cont.)

In Puerto Rico (Cont.)

3. Smarter Work Zones

Smarter Work Zones effort focuses on two strategies:

1. Coordination of roadway construction projects to reduce work zone impacts
2. Using technology applications to dynamically manage traffic in the work zone environment

3. Smarter Work Zones (Cont.)

- Effective traffic management during construction is necessary to:

Minimize Travel Delays

Ensure motorist and worker safety

Maintain access to local businesses and residences

Complete road work on time.

- These operational and safety benefits can be significant, especially in **high-impact areas** such as metropolitan regions and corridors and during special events

3. Smarter Work Zones (Cont.)

Road Project Coordination

- Involves coordination within a single project and/or among multiple projects within a corridor, network, or region, and possibly across agency jurisdictions, to:
  - Minimize work zone impacts
  - Produce time and cost savings

- This internal and external agency road project coordination results in:
  - Reduced numbers of street cuts
  - Earlier identification of project impacts
  - Greater ability to reduce and manage traffic disruptions from road work
  - Cost savings
  - Better quality road surfaces
  - More satisfied customers.

3. Smarter Work Zones (Cont.)

Technology Applications

- Queue Management
  - Can alert drivers to a line of vehicles ahead caused by a work zone so they can slow down safely.
- Speed Management
  - Variable speed limit (VSL) dynamically manage work zone traffic based on real-time conditions such as congestion and weather
  - Combining VSL with automated enforcement can increase driver compliance with displayed speed limits
- Both queue and speed management use a range of technologies for detection, including Bluetooth® sensors and probe vehicles.

3. Smarter Work Zones (Cont.)

Current State of the Practice

- Road project coordination is being used successfully from coast to coast in metropolitan areas and along interstate corridors.
- According to FHWA's Work Zone Management Program Web-based compendium of resources, VSLs or advisories have been used on at least 30 interstate corridors in 14 states.
- In addition, at least 10 states, including Michigan, Minnesota, Oregon and Washington, have mature queue management systems that generate accurate and dependable results.

Major Activities Associated with EDC

- EDC Exchange, webinars, workshops, symposium and seminars in Puerto Rico and USVI
- EDC Technical Oversight in PR and USVI Implementation Plan
- Incorporating EDC articles in bilingual Newsletter- "*El Puente*"

Conclusions

1. The EDC implementation plan in Puerto Rico is progressing positively as expected.
2. FHWA Exchange Program and related webinars have provided a healthy transition in the implementation of EDC in Puerto Rico.
3. The exchange of knowledge and experience gained by undergraduate and graduate students from UPRM and Purdue University has motivated them to continue their professional career in transportation, does increasing the workforce in this discipline.

Conclusions (cont.)

4. The private sector has been pro-active in collaborating with the implementation of EDC in Puerto Rico.
5. The key for success of EDC implementation in this 1st Phase has been effective communications between PRHTA , FHWA, PR-LTAP, administrative agencies and the private sector officials.

Lessons Learned

- The importance of identifying the best resources and training tool for a particular EDC initiative and audience.
- A motivated and actively participating audience is crucial
- Quality and excellence is our trademarks, in seminars, workshops, symposiums, task force.
- Consistency, Practice what you preach!

Available EDC tools published by FHWA

Available EDC tools published by FHWA

Additional Information regarding EDC Projects in Puerto Rico and USVI

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Thank you for the opportunity!