El Puente

Newsletter of the Puerto Rico Transportation Technology Transfer Center
University of Puerto Rico at Mayaguez
Volume 25, Number 3, 2011

www.uprm.edu/prt2/

Making EVERY DAY COUNTS in the Caribbean

This edition is the first in a series that focuses on the implementation activities of EVERY DAY COUNTS in Puerto Rico and the U.S. Virgin Islands.

EVERY DAY COUNTS (EDC) is a Federal Highway Administration (FHWA) initiative to assist the States and Territories in the deployment of technologies and innovative procedures to improve the safety of our highways, protect the environment, and shorten the project delivery. Visit the FHWA EDC website for more information: http://www.fhwa.dot.gov/everydaycounts/.

The Puerto Rico Transportation Technology Transfer Center (PR-LTAP) is assisting the Puerto Rico Highway and Transportation Authority (PR-HTA) as Technical Oversight and Training Coordinator in the following nine EDC strategies: 1) Warm-Mix Asphalt, 2) Safety Edge, 3) Adaptive Signal Control Technologies, 4) Design-Build, 5) Prefabricated Bridge Elements, 6) Geosynthetic Reinforced Soil, 7) Enhanced Technical Assistance on Stalled EIS's, 8) Flexibilities in ROW, and 9) Flexibilities in Utility Relocation.

The PR-LTAP Center is also the Training Coordinator for the three EDC strategies being implemented by the US-Virgin Islands Department of Public Works: 1) Warm-Mix Asphalt, 2) Safety Edge, and 3) Flexibilities in ROW.

In this Issue

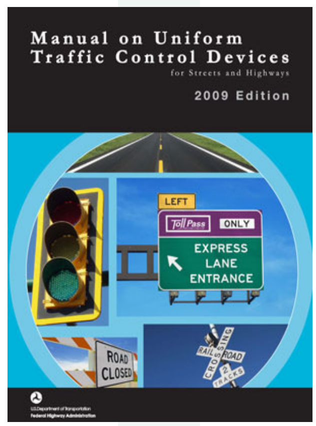
The Puerto Rico Transportation Technology Transfer Center is part of a network of 58 centers through the United States that comprises the Local Technical Assistance Program (LTAP) and the Tribal Technical Assistance Program (TTAP), which enable local governments, counties, and cities, to improve their 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.

FHWA Proposes to Change Standard Definition and Compliance Dates in the MUTCD 2009

The Manual on Uniform Traffic Control Devices (MUTCD) defines the standards, guidance, and options used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The current edition of the MUTCD can be downloaded from: mutcd.fhwa.dot.gov/kno_2009.htm.

Adoption of MUTCD 2009

The effective date of the MUTCD 2009 Edition was January 15, 2010, providing States a two-year window to adopt the 2009 National MUTCD as their legal State standard for traffic control devices or have a State MUTCD/supplement that is in substantial conformance with the National Manual. Puerto Rico has adopted the National MUTCD along with a State supplement, which can be viewed at www.dtop.gov.pr/carretera/det_content.asp?cn_id=131.



Engineering Judgment and Standard Definition in the MUTCD 2009

The Federal Register published on August 2, 2011 a Notice of Proposed Amendment (NPA) to change Sections 1A.13 and 1A.09 to address the STANDARD definition and the use of engineering judgment and studies.

The MUTCD 2009 added to its definition of STANDARD that "**Standard statements shall not be modified or compromised based on engineering judgment or engineering study**." The interpretation of this definition raised tort liability concerns by State attorneys general if State DOT's do not comply 100% with all Standards.

The NPA proposes to remove the statement under controversy from MUTCD Section 1A.13. In addition, the NPA proposes to add a guideline and a option statements to MUTCD Section 1A.09 to indicate the use of engineering judgment and engineering studies for the decision to use a particular traffic control device, or when to deviate from a Standard statement at a location.

Compliance Dates in MUTCD 2009

The Federal Register published on August 31, 2011 a Notice of Proposed Amendment (NPA) to address changes in the compliance dates for different revised and new rules in the MUTCD. The MUTCD 2009 Edition includes Table I-2, which indicates 58 target compliance dates established by the FHWA for the implementation of revised or new traffic control devices requirements or designs. These dates were set by Final Rules in the years 2000, 2003, 2007, and 2009.

The compliance dates are meant for the replacement of existing traffic control devices that were not compliant with MUTCD requirements. New installations must automatically comply with MUTCD 2009 on Federal-aid projects, and all other projects, once the State adopts the new MUTCD.

The NPA proposes to eliminate 8 expired compliance dates and 38 future compliance dates from the MUTCD 2009, in addition to extend or revise other 4 compliance dates.

The compliance dates for some of the requirements proposed to stay unchanged are:

- 2A.19—Crashworthiness of sign supports on roads with 50-mph speed limits or higher, if located within the clear zone. (**Jan. 17, 2013**)
- 2B.40–Use of ONE-WAY signs on streets that only allow traffic in one direction. (**Dec. 31, 2019**)

- 2C.06 thru 2C.14—Use of horizontal alignment warning signs. (**Dec. 31, 2019**)
- 2E.31, 2E.33, and 2E.36–Use of plaques for left-hand exits on freeways and expressways. (**Dec. 31, 2014**)

- 6D.03, 6E.02, and 7D.04-Use of high visibility apparel for all workers, flaggers, and school crossing guards located within the road right-of-way. (**Dec. 31, 2011**)

Compliance Dates for Traffic Signals

Section 4D.26 of the MUTCD 2009 required agencies to establish the duration of the yellow change and red clearance intervals using engineering practices, by **December 31, 2014**, or when adjustments to signal timings were made.

The NPA proposes to extend the implementation of this requirement by five additional years after the effective date of the final rule of this MUTCD revision.

Section 4E.06 required that the timing of pedestrian signals include a minimum 3 second buffer interval after the end of the pedestrian change interval or countdown/flashing phase and the start of green for any traffic conflicting movement at the intersection. The 3-second buffer can be integrated to the yellow change interval only, in combination with the yellow change and red clearance periods, or with the red clearance period only. Also, the buffer could be integrated to the green time of the vehicular movement not in conflict with the pedestrian movement.

The NPA proposes to extend the implementation of this requirement by five additional years after the effective date of the final rule of this MUTCD revision.

Compliance Dates to be Removed

Certain provisions in the MUTCD 2009 included compliance dates that already expired and are not essential as most agencies likely upgraded these traffic control devices already. Some of the compliance dates removed are for:

- 2B.09—Changes in YIELD sign application.
- 2C.30—Removal of PAVEMENT ENDS symbol sign.

- 2C.50, 7B.11, 9B.18-Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow plaque.
- 7B.11-Use of AHEAD or the distance plaques for the School Advance Crossing Assembly signs.

What about the Minimum Sign Retroreflectivity Levels?

The MUTCD 2009 required agencies to have implemented a sign assessment or management method to maintain sign retroreflectivity at or above the established minimum levels in Table 2A-3 by **January 22, 2012** .

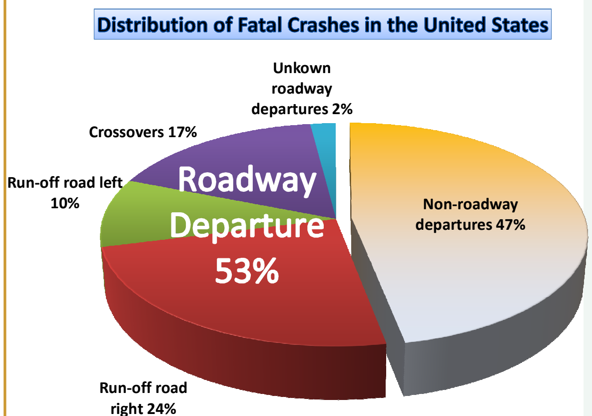
The NPA proposes to extend the compliance date for the implementation of the sign assessment or management method two additional years after the effective date of the final rule of this MUTCD revision. In addition, the requirement for the method will apply only to regulatory and warning signs.

The NPA proposes to eliminate the compliance dates for the replacement of signs that do not meet the MUTCD 2009 minimum retroreflective levels. The removal of these compliance dates does not mean that a jurisdiction is not anymore required to replace signs as their retroreflectivity is degraded below the minimum, but just that there is not a specific date of when it has to be done. The jurisdiction will now have the flexibility of deciding when the replacement is necessary based on the sign assessment or management method. Therefore, the jurisdiction still needs to defend its sign management and replacement practices if faced with a liability issue.

For the complete information about the proposed changes to the MUTCD 2009 and the publication of the Final Rule for the Revision visit the official FHWA MUTCD Internet site at http://mutcd.fhwa.dot.gov/index.htm.

Implementation of the SAFETY EDGE in the Caribbean

The Safety Edge, one of the EDC initiatives aimed at improving the safety on our highways, is a simple, but highly effective solution to reduce roadway departure crashes on rural highways. Roadway departure related crashes account for 53% of the annual road fatalities in the United States.



Fatalities from off-roadway related crashes in Puerto Rico account for approximately 20% of the total road fatalities. Rural highways are predominantly related to fatalities from off-roadway related crashes with around 65% of the total off-roadway fatalities.

Traditional hot-mix asphalt paving procedures create a vertical edge with a drop-off of 1-6 inches or more from the adjacent roadside level.

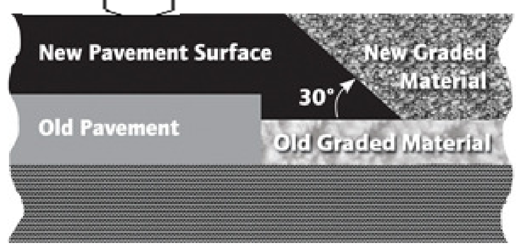
This drop-off prevents drivers to return to the roadway and often leads drivers to overcorrect with greater steering angle than the desire to remount the drop-off, causing the driver to lose control of the vehicle and cause a crash. Sites with promise include horizontal curves, near roadside mailboxes, unpaved pull-outs, shaded and eroded areas and overlays.

Many agencies mitigate the presence of the edge drop-off by re-grading the adjacent unpaved material to the level of the new pavement, but as the re-graded shoulder settles or is eroded months after its construction, the edge drop-off is exposed once again. This situation creates another problem as the new pavement edge starts to crack and deteriorate with the passing of vehicle loads and affecting its durability.

Watch a video of a test showing a vehicle experiencing a vertical edge drop-off.

http://fhwa.na3.acrobat.com/safetyedgedrop

This new technique consists on shaping the pavement edge in approximately a 30° angle to eliminate the problem of the vertical drop-off with the adjacent roadside. The diagonal angle of the pavement edge is located where the pavement interfaces with a graded material. The Safety Edge allows the driver to re-enter the paved roadway with more stability, minimizing crashes.



Safety Benefits

A FHWA pooled-fund study evaluated the implementation of the Safety Edge in three states: Georgia, Indiana and New York. The study included rural two-lane and multi-lane roads with paved shoulders with widths of 4 feet or less, and rural two-lane roads with unpaved shoulders only. The evaluation approach was the Empirical Bayes before-after technique.

Although the effectiveness of the Safety Edge in preventing crashes could be combined with the effect of a smother pavement (i.e. higher speeds), the study found a 5.7% crash reduction in total crashes for all two-lane highways. This reduction is suggested as an estimate as the study results were not statistically significant.

The Caribbean Experience with Safety Edge

Across the Nation, 44 States and Territories plan to construct the Safety Edge on paving projects or have adopted the technique as a Standard Practice in 2011. Four commercial equipment manufacturers currently offer shoe devices to be attached to paving machines for creating the Safety Edge on asphalt pavements.

The Puerto Rico Highway and Transportation Authority (PRHTA), the Federal Highway Administration (FHWA), and the Puerto Rico Local Technical Assistance Program Center (PR-LTAP) are working together to implement the Safety Edge in Puerto Rico.

The following tasks were performed:

- Acquisition of the Advant-Edge Model Ramp Champ and TransTech Shoulder Wedge Maker as part of the FHWA loan program to States and LTAP Centers.
- Participation in training activities about the installation and measurements requirements for the Safety Edge experiments.
- Selection of candidate paving projects to implement the Safety Edge technology.
- Visits to the Betteroads Asphalt Corp. Plant for the training and installation of the Safety Edge shoes.
- Preparing the screed unit of the paver for the installation of the Safety Edge shoes.
- Layout of experimental plan for Safety Edge and density measurements.
- Conducted the installation of the Safety Edge on existing road paving projects.
- Visit to the Robles Asphalt Plant for the training and the installation of the Safety Edge shoes
- Conducted Safety Edge trial experiments with saturated surface dry sand.

For specifications and information about the two Safety Edge shoes visit:

www.advantedgepaving.com

www.transtechsys.com

The following table provides the comparison between the two Safety Edge shoes used in Puerto Rico. Thanks to the Colorado LTAP Center and the FHWA for lending us the shoes.

Hardware Comparison	
TransTech Shoulder Wedge Maker (SWM)	**Advant-Edge Ramp Champ (RC)**
	
It has a fixed angle of 30°.	The wedge can be adjusted from 5° to 30°.
It doesn't have adjustable sides; it requires a match pair for each side of the paver.	It has a removable shoe that allows it to be used on either the left or the right side of the screed unit of the paver.
It has a fixed Safety Edge profile.	Creates a tapered Safety Edge or a longitudinal center lane joint.
The installation process requires no technical training.	The installation process requires no technical training.
Requires continuous adjusting for changing surface profiles.	Designed to automatically follow the shoulder elevation.
Weight = 50 lbs.	Weight = 115 lbs.
Initial Cost ≈ $4,200	Initial Cost ≈ $4,600

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On June 2011, the PR-LTAP, along with Betterroads Asphalt Corp., conducted two experiments in which the Safety Edge was implemented on a 1-km road section. The experiments took place in on-going paving projects using the Advant-Edge Ramp Champ and the TransTech Shoulder Wedge Maker in Highway PR-184 in Patillas and Highway PR-182 in Yabucoa, respectively.

The first task on the PR-182 project consisted on paving the westbound lane using the Advant-Edge Model Ramp Champ Safety Edge shoe with S paving mixture. Three dump trucks carried the initial mix. The experiment started around 9:30 a.m.

Once the paving of the westbound lane was completed and compacted, the Advant-Edge Safety Edge shoe was replaced with the TransTech Shoulder Wedge Maker and the paving resumed in the eastbound direction with three additional dump trucks with approximately 24.5 tons of asphalt mixture.

Installation of Ramp Champ (from left to right): Ramón Caunabo (Betteroads), Reinaldo Silvestry (M.Eng. UPRM), Leilany Benejam (BS Purdue), Eric Rivera (BS PUPR), Benjamín Colucci (PR-LTAP), Daniel (Betterroads) and Freddie Salado (M.Eng., UPRM).

Pictures from the Test Site of the Safety Edge on Highway PR-184 in the Municipality of Patillas.

Preliminary Data Analysis: Compaction and Safety Edge Angle - PR-184 Patillas

TransTech: Shoulder Wedge Maker

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
% Compaction	93.49	0.98	92.3	93.3	95.1
% Compaction @ 1 ft	82.90	2.56	78.2	83.1	86.8
Slope (°)	25.8	5.69	13.8	27.2	36.4

Advant-Edge: Ramp Champ

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
% Compaction	94.31	1.29	92.6	94.1	96.0
% Compaction @ 1 ft	83.60	3.38	79.1	85.2	87.4
Slope (°)	26.3	5.21	16.8	29.0	29.8

The Safety Edge experiment conducted by Robles Asphalt was done inside their facility in Ponce. A cold wash sand with a 10% of humidity was used instead of an asphalt mix to perform a test trial with both Safety Edge shoes. A surface layer of approximately 4-1/2" and 50 feet long was produced for each Safety Edge Shoe, which were installed in the screed unit plate of the paver. Temperature and Slope measurements were taken on site every 5 feet for statistical purposes.

Pictures from the Test Site of the Safety Edge on the Robles Asphalt Plan.

On October 2011, a 2.2-mi long section of the Queen Mary Highway (Route 70) on Saint Croix, was paved using the Safety Edge. The TransTech Shoulder Wedge Maker was used on the paver to construct both sides of the road. The Virgin Island Pavement Company and Eng. Thomas John from the Department of Public Works were in charge of the paving project. *(continues on page 9)*

Pictures from the Test Site of the Safety Edge on Route 70 in Saint Croix, US Virgin Islands.

Preliminary Data Analysis: Safety Edge Angle - PR-Robles Asphalt, Ponce

TransTech: Shoulder Wedge Maker

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
Slope (°)	29.04	1.04	27.40	29.10	31.20
Temperature (F)	88.96	0.86	87.00	89.00	90.00

Advant-Edge: Ramp Champ

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
Slope (°)	30.80	1.63	26.40	31.10	32.40
Temperature (F)	88.91	0.83	87.00	89.00	90.00

Center News: *Exchange Students Participate in Summer Research*

The University of Puerto Rico at Mayaguez (UPRM) held its Summer Transportation Research Exchange Program during 2011 with the participation from the University of Rhode Island (URI) and Purdue University. This year marked the first time that Purdue participated in the Exchange Program, while URI participated for the 7th time.

The objective of the exchange program is to promote the collaboration of the universities in research projects related to transportation topics. In addition, the program looks to motivate students for a career in transportation. The Coordinators of the Exchange Program are Dr. Alberto Figueroa (UPRM), Dr. Deborah Rosen (URI) and Eng. John Habermann (Purdue). The Program has the support of the Dwight D. Eisenhower Transportation Fellowship Program from the Federal Highway Administration.

During this summer, four students from UPRM, two students from URI, and two students from Purdue participated in the Exchange Program.

The students interns and their respective research projects were:

- Leilany Benejam, Purdue BSCE Student, *Implementation of Safety Edge in Puerto Rico.*
- Davis Chacon, UPRM MSCE student, *Establishing a Method for Extraction of Polycyclic Aromatic Hydrocarbons from Contaminated BMP Soils*
- Jean Elias, UPRM BSCE student, *Workforce Development Documentation for the Safe Use of Traffic Control in Spanish*
- Claudio Figueroa, UPRM BSCE student, *Evaluation of Sign Replacement Projects in Rural Indiana*
- Josué Ortiz, UPRM BSCE student, *Message Signs Study to Improve the Bottleneck Issue at Work Zones.*
- Matthew Perkins, URI BSCE student, *Design Wave Conditions for Puerto Rico and the U.S. Virgin Islands.*
- Susan Refai, Purdue BSCE student, *Geosynthetic Reinforced Soil Integrated Bridge Systems in Puerto Rico.*
- Laura Schifman, URI PhD CE student, *Possible Impacts on High Pre-term Birth Rates in Puerto Rico.*

Thanks to the Academic Advisors for their collaboration: Dr. Miguel Canals, Dr. Benjamin Colucci, and Dra. Ingrid Padilla from UPRM; Eng. John Habermann from Purdue; Dra. Vinka Craver and Dr. Jyh-Hone Wang from URI.

 (continues from page 7)

How does the Safety Edge compare with conventional asphalt paving process?

The Safety Edge shoe can be installed in new or existing asphalt resurfacing equipment. The attachment acts as a compacted pavement edge in the desired 30° shape. The additional cost to implement the Safety Edge technique is minimal; it is estimated to cost less than 1% of added asphalt material.

The unit cost of implementing the Safety Edge in the United States is approximately $536 to $2,145 per mile for the application on both sides of the roadway, based on the volume of asphalt required to form the safety edge.

Advantages:

- Improve the short and long-term safety of the roadway.
- Improves pavement density, which makes the edge more durable.

Disadvantages:

- Initial investment to purchase the safety edge shoe device (needs less than 1% of additional HMA material).
- Special training is needed for the paving construction crew.

The PR-HTA, USVI-DPW, and FHWA will continue the implementation of the Safety Edge technique in future projects by integrating the collaboration from other asphalt companies.

For Safety Edge implementation resources visit:

http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge.

For information about other EDC initiatives visit:

http://www.fhwa.dot/gov/everydaycounts.

For information about the implementation of EDC in Puerto Rico and the US Virgin Islands visit:

http://www.uprm.edu/prt2.

References:

FHWA. 2011. Safety Evaluation of the Safety Edge Treatment. Summary Report. FHWA-HRT-11-025.

FHWA. June 2011. Building Better Pavements that Save Lives: The Safety Edge. Focus Magazine.

New Design Guidelines for Modern Roundabouts

Different types of circular intersections or traffic circles have been used extensively in the geometric design of roads in Europe. In the United States, circular intersections have been part of the transportation system; however, their usage decreased after the 1950's as rotary intersections began experiencing problems with congestion and safety. Modern roundabouts are a type of intersection with a general circular shape, with clockwise circulation, priority to circulating vehicles, yield control on all entries, and geometric features that creates a low-speed environment.

The National Cooperative Highway Research Program recently published its **Report 672—*Roundabouts: An Informational Guide***, that supersedes the FHWA Guide published in 2000. As of October 1997, a total of 38 modern roundabouts were built in the United States. As a comparison, more than 2,000 new roundabouts have been built across the United States since the publication of the 2000 Guide.

Roundabouts are generally classified in three basic categories according to their size and number of lanes.

There are a number of locations where roundabouts are commonly found to be advantageous.

Common site	Advantages
Schools	Reduction in vehicle speeds in and across the roundabout, im-
Rural intersections	Reduce fatal and injury crashes, even on high speed approaches
Gateway treatments	Creates community focal points, landscaping and other gateway
Commercial developments	Aesthetically pleasing design alternative to traffic signals with
Intersections w/ high delay	Reduces delay at stop-controlled or signalized intersections
Residential subdivisions	Low-speed and low-noise with little routine maintenance
Interchanges	More efficient use of bridge structure between ramp terminals, extends design life and substantially reduces construction
Corridors	Produce efficiency through a gap acceptance process, no need for platoon progression, reduces the number of travel lanes and ROW

Design Element	Mini roundabout	Single-lane roundabout	Multiple-lane roundabout
Desirable maximum entry design speed (mph)	15 to 20	20 to 25	25 to 30
Maximum number of entering lanes per approach	1	1	≥2
Range of inscribed circle diameter (feet)	45 to 90	90 to 180	150 to 300
Central island treatment	Fully traversable	Raised (may have traversable apron)	Raised (may have traversable apron)
Typical max. daily volume on 4-leg roundabout before requiring detailed capacity analysis (vpd)	Up to 15,000	Up to 25,000	Up to 45,000

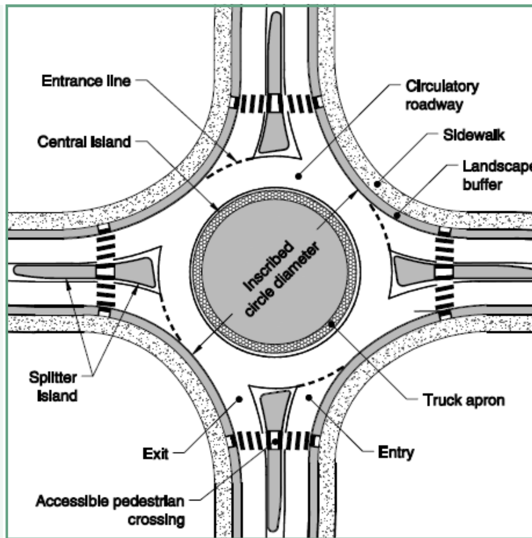
The selection of a modern roundabout requires the balancing of competing objectives such as safety, operational performance, and accessibility for all users, costs, land use compatibility, aesthetics, and environmental aspects.

Site constrains	Limitations
Arterial intersections	Level of service on the arterial might be better with a signalized intersection
Physical complications	ROW limitations, utility conflicts, drainage problems, grades or unfavorable topography
Conflicts w/ high traffic volumes	Heavy pedestrian or bicycle movements might require supplemental traffic control
Proximity of generators w/ high traffic	High volumes of trucks or oversized vehicles
Proximity of other conditions	Drawbridges or at-grade rail crossings that require preemption
Proximity of bottlenecks	Routinely back up traffic, such as over-capacity signals. If traffic comes to a halt, the roundabout
Delay to major road	Unacceptable delay to major road could be created

Fundamentally, roundabout design involves achieving the following key objectives:

- Slow entry speeds and consistent speeds through the roundabout;
- The appropriate number of lanes and lane assignment to achieve adequate capacity, lane volume balance, and continuity of lanes through the roundabout;
- Smooth channelization that is intuitive to drivers and results in vehicles naturally using intended lanes;
- Adequate accommodation for the design vehicles;
- A design that meets the needs of pedestrians and bicyclists; and
- Appropriate sight distance and visibility.

A well-design roundabout reduces vehicle speeds upon entry and achieves consistency in the relative speeds.



Determining the inscribed circle diameter of a roundabout is the first step towards preparing a design and is determined by a number of design objectives, including design speed, path alignment, and design vehicles. The selection of the diameter may be somewhat subjective, but its ultimate size is an output meeting other objectives (speed control, design vehicle, etc.).

Roundabout type	Typical design vehicle	Inscribed circle diameter (ft)
Mini	SU-30	45 to 90
Single-lane	B-40	90 to 150
	WB-50	105 to 150
	WB-67	130 to 180
Two-lane	WB-50	150 to 220
	WB-67	165 to 220
Three-lane	WB-50	200 to 250
	WB-67	220 to 300

NCHRP Report 672 can be downloaded at: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf

Future Seminars and Conferences

PR-LTAP Seminars and Workshops

EDC Seminar on Geosynthetic Reinforced Soil for Integrated Bridge Systems
Date: November 18, 2011
Place: CIAPR, Hato Rey

EDC Seminar on Safety Edge
Date: December 2, 2011
Place: CIAPR, Ponce

EDC Seminar on Flexibilities in Right-of-Way Acquisition
Date: December 14, 2011

EDC Seminar & Product Showcase — Traffic Signal Optimization with Adaptive Signal Control Technologies
Date: December 19-20, 2011
Place: CIAPR, Hato Rey

For more information about our seminars and how to register please contact: Ms. Grisel Villarrubia at (787) 834-6385 or at grisel.villarubia1@upr.edu or visit our website at www.uprm.edu/prt2.

Other Conferences and Summits

- **2011 Institute of Transportation Engineers District 10 Annual Meeting: Transportation Initiatives on the Road to Discovery.** November 30—December 2, 2011; Hilton St. Petersburg Bayfront Hotel, St. Petersburg, Florida. (www.floridasectionite.org/meeting.html)
- **2012 Transportation Research Board Annual Meeting:** January 22-26, 2012, Marriott Wardman Park, Washington, DC. (www.trb.org/AnnualMeeting2012/AnnualMeeting2012.aspx)

Know your Trainer: Dr. Jose L. Perdomo

Dr. Jose L. Perdomo is part of our family of Instructors. He has offered seminars and workshops in topics such as Construction Project Management, Basics of Planning and Construction Project Programming, and Procurement and Construction Claims related to Transportation and Public Works for the training program of the PR LTAP.

He is Associate Professor of the University of Puerto Rico at Mayaguez (UPRM) since January 2005. Dr. Perdomo is part of the Construction Management Area at the UPRM Department of Civil Engineering and Surveying.

Dr. Perdomo has been nominated as Distinguish Faculty for the UPRM Department of Civil Engineering and Surveying from 2006 to 2009. He has served as member of the Evaluating Committee for College Accreditation of the Higher Education Council of Puerto Rico, member of the Academic Affairs Committee of the Department of Civil Engineering and Surveying, reviewer of the ASCE Journal of Construction Engineering and Management, between other synergistic activities.

Education

- *Associate Degree in Civil Engineering Technology from the University of Puerto Rico at Ponce in 1993*
- *Bachelor Degree in Civil Engineering from the University of Puerto Rico at Mayaguez in 1997.*
- *Master in Science Degree in Construction Engineering and Management from Virginia Tech University in 2001.*
- *Doctoral Degree in Construction Management and Building Science, Environmental, Design and Planning from Virginia Tech University in 2002.*

Even though the extended time dedicated to his research projects, engineering publications and teaching at UPRM, he also enjoys exercising and play sports such as baseball, basketball, and racquetball.

Message from the Editor

Welcome to the Third Edition for 2011 of EL PUENTE. This newsletter is a first in a series that will document the experience of transportation agencies in Puerto Rico and the US Virgin Islands with the implementation of the EVERY DAY COUNTS (EDC) initiative of the Federal Highway Administration. Puerto Rico is implementing nine EDC strategies and the US Virgin Islands are implementing three EDC initiatives with the objective of improving safety, enhance traffic operations, and shorten the completion of road projects to improve our quality of life.

This edition also includes important information about proposed revisions to the MUTCD with focus on the removal or extension of several compliance dates established in the MUTCD 2009 Edition. The third article provides our readers with general design guidelines about modern roundabout elements that must be considered in any intersection upgrading projects. Our trainer profile for this issue is Dr. José Perdomo, from the UPRM Department of Civil Engineering and Surveying, and one of our instructors in the area of Construction Project Management.

Alberto M. Figueroa Medina, **Ph.D., P.E.**

Technical Information, Publication, Video or Training Request Form

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COMMENTS/SUGGESTIONS:____

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The Center's staff welcomes all your comments and suggestions. To contact the Center, please send all correspondence to the following e-mail address or contact us at:

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El Puente Newsletter

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