

Green Streets and Highways Conference 2010

**Denver, Colorado, USA
14-17 November 2010**

Editors:

Neil Weinstein

ISBN: 978-1-61782-131-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2010) by the American Society of Civil Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the American Society of Civil Engineers
at the address below.

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191

Phone: (800) 548-2723
Fax: (703) 295-6333

www.asce.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

Table of Contents

Sustainable Planning

Creating a Sustainable Neighborhood: Mercer Corridor Project	1
Jeanne Acutanza, Roger Mason, and Angela Brady	
Applying Principles of Denver Strategic Transportation Plan: East Side Corridor	15
Mike Heugh and Lisa Candelaria	
County of Hawai`i La`aloa Avenue Extension CSS	26
Buddy Desai and Cheryl Yoshida	
Educational Toolkit for Context Sensitive Solutions	36
T. L. Coleman, B. Rasegan, and K. DeForrest	
A Process for Measuring Context Sensitive Solutions Benefits	46
Nikiforos Stamatiadis, Adam Kirk, Don Hartman, and Jerry Pigman	
Urban Goods Movement Case Studies	57
Marsha Anderson Bomar and Erika Becker	
FM 518 Corridor Improvement Study and Implementation, Pearland, Texas	68
Harpreet Bedi, Don Holloway, and Andrea Broughton	
Roundabouts and Sustainable Design	82
Alex Ariniello and Bart Przybyl	

Livable Communities

Contextually Complete Streets	94
Lindsey R. Sousa and Jennifer Rosales	
Quantifying Non-Motorized Demand—A New Way of Understanding Walking and Biking Demand	107
Preston J. Elliott and Jeffrey L. Hammond	
Regional Trail Spines and Bikeway Networks: A Priority Strategy for Greening Streets and Highways	116
Spencer Finch and Marc Morfei	
Improving Bicycle Safety with More Bikers: An Intersection-Level Study	135
K. L. Nordback and W. E. Marshall	

Stormwater and Environmental Planning and Design

Retrofitting with Bioretention and a Bioswale to Treat Bridge Deck Stormwater Runoff	147
R. J. Winston, S. K. Luell, and W. F. Hunt	
Towards Green Bridges	163
Scott Snelling	
Best Practices in Addressing NPDES and Other Water Quality Issues in Highway System Management	180
Scott M. Taylor and Patricia A. Cazenias	
Green Street Retrofit in an Urban Transportation Infrastructure	190
Neal Shapiro and Brian Valentine	
Permeable Friction Course for Sustainable Highways	201
Brad Eck, Brandon Klenzendorf, Randall Charbeneau, and Michael Barrett	
Realizing the Benefits of the Planning and Environmental Linkage (PEL) Process: Federal Boulevard (5th Avenue to Howard Place), Denver, Colorado	213
Karen Good and Kevin Maddoux	
LED Streetlight Application Assessment Project Pilot Study in Seattle, WA	225
Dana Beckwith, Edward Smalley, Mark Yand, Lok Chan, and Xiaoping Zhang	

Green Pavements

Cool Pavements As a Sustainable Approach to Green Streets and Highways	235
K. Wayne Lee, Vinka O. Craver, Steven Kohm, and Henry Chango	
Durability of Sustainable Concrete Mixtures	248
R. Liu, S. A. Durham, and K. L. Rens	
Carbon Nano Fiber Reinforced Cement Composite for Energy Harvesting Road	258
Sudip Bhattacharjee, A. K. Batra, and Jacob Cain	
Trace Element Leaching from Recycled Pavement Materials Stabilized with Fly Ash	272
Jonathan O'Donnell, Craig H. Benson, Tuncer B. Edil, and Sabrina L. Bradshaw	
Using Foundry Sand in Green Infrastructure Construction	280
S. L. Bradshaw, C. H. Benson, E. H. Olenbush, and J. S. Melton	
The Use of Tire-Derived Aggregate in Road Construction Applications	299
Dana Humphrey and Michael Blumenthal	
Development of a Design System for Permeable Interlocking Concrete Pavement	314
Donald J. Swan and David R. Smith	
The Effect of Recycled Asphalt Materials on Hot Mixed Asphalt Pavement Performance	323

Mark J. Watson, James McGraw, Eddie Johnson, Dave Linell, and Shongtao Dai

City of Saskatoon’s Green Streets Program—A Case Study for the Implementation of Sustainable Roadway Rehabilitation with the Reuse of Concrete and Asphalt Rubble Materials **337**

Marlis Foth, Duane Guenther, Rielle Haichert, and Curtis Berthelot

Utilization of Post Consumer Recycled Asphalt Shingles and Fractionated Recycled Asphalt Pavement in Hot Mix Asphalt **349**

Andrew Cascione, R. Christopher Williams, Steve Gillen, Ross Bentson, and Debra Haugen

Structural/Hydrologic Design and Maintenance of Permeable Interlocking Concrete Pavement **360**

David R. Smith and William F. Hunt

Laboratory Evaluation of HMA Containing RAP and PMB **378**

Adam Zofka, Alexander Bernier, James Mahoney, and Scott A. Zinke

High Volume Fly Ash Concrete for Highway Pavements **390**

J. L. Chrismer and S. A. Durham

Sustainable Concrete for the Urban Environment: A Proposal to Increase Fly Ash Use in Concrete **401**

Andrea V. Solis, Stephan A. Durham, Kevin L. Rens, and Anu Ramaswami

Durable “Green” Concrete from Activated Pozzolan Cement **408**

James Hicks

Concrete in the Inner Circuit: A Sustainable Solution for Mexico City **431**

Gaytan C. Arturo, Montaño R. Homero, Márquez M. Erika, and Uribe A. Roberto

Thin Whitetopping for Green Highways **438**

Sharmin Sultana and Mustaque Hossain

Studies on a Cement Kiln Dust (CKD)-Stabilized Low-Strength Soil for Road Pavement Construction in Eastern Nigeria **449**

R. O. Oduola

Sustainable Rating Systems and Tools

Moving towards Sustainability: New York State Department of Transportation’s GreenLITES Story **461**

Gary R. McVoy, Debra A. Nelson, Paul Krekeler, Elisabeth Kolb, and Jeffery S. Gritsavage

Use of BE²ST In-Highways for Green Highway Construction Rating in Wisconsin **480**

Jincheol Lee, Tuncer B. Edil, Craig H. Benson, and James M. Tinjum

The Development of I-LAST Illinois—Livable and Sustainable Transportation **495**

Douglas Knuth and John Fortmann