Editorial Board

Senior Editor
Norman G. Miller
University of San Diego

Associate Editors
Pernille H. Christensen
Asia Pacific Associate Editor
University of Technology Sydney

Robert A. Simons
North American Associate Editor
Cleveland State University

Kwame Addae-Dapaah
University College London
Richard Loope
Arizona State University

Michel Boudrias
University of San Diego
Isaac Megbolugbe
Johns Hopkins University

Steven C. Bourassa
University of Louisville
Helen Neill
University of Nevada, Las Vegas

Stuart Brodsky
New York University
Andrew Nelson
RREEF Real Estate

Soña V. Dermisi
University of Washington
Gary Pivo
University of Arizona

Tim Dixon
University of Reading
Darren A. Prum
Florida State University

Franz Fuerst
University of Cambridge
Richard Reed
Deakin University

Angela Guggemos
Colorado State University
Stephen E. Roulac
Roulac Global Places

Rebecca Henn
Pennsylvania State University
Grant I. Thrall
Business Geography Advisors

Jerry Jackson
Smart Grid Research Consortium, LLC
Ron Throupe
University of Denver

John A. Kilpatrick
Greenfield Advisors, LLC
Charles Tu
University of San Diego

Daniel B. Kohlhepp
Johns Hopkins University
Bing Wang
Harvard University

Constantine E. Kontokosta
New York University
Sara J. Wilkinson
Royal Institution of Chartered Surveyors (RICS)

Steven Laposa
Alvarez & Marshal’s Real Estate Advisory Services (REAS)
Elaine Worzala
College of Charleston
## Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>ix</td>
<td>Foreword</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Heterogeneous Price Premiums in Sustainable Real Estate? An Investigation of the Relation between Value and Price Premiums</td>
<td>Spencer Robinson and Pat McAllister</td>
</tr>
<tr>
<td>21</td>
<td>Incorporating Green Building Features and Initiatives into Commercial Property Valuation</td>
<td>Saul Nurick, Karen Le Jeune, Emma Dawber, Ryan Flowers, and Jennifer Wilkinson</td>
</tr>
<tr>
<td>41</td>
<td>The Relevance of Green Building Practice in Emerging Markets: A Perceptual Analysis of Commercial and Industrial Building Users in Ibadan, Nigeria</td>
<td>A. Olaleye, T.O. Ayodele, and M.O. Komolafe</td>
</tr>
<tr>
<td>60</td>
<td>Factors Influencing U.S. Homebuilders’ Adoption of Green Homebuilding Products</td>
<td>Andrew R. Sanderford, Matthew J. Keefe, C. Theodore Koebel, and Andrew P. McCoy</td>
</tr>
<tr>
<td>83</td>
<td>Measuring Highway (Noise) Impacts on House Prices Using Spatial Regression</td>
<td>Marcus T. Allen, Grant W. Austin, and Mushfiq Swaleheen</td>
</tr>
<tr>
<td>112</td>
<td>Appraising Sustainable Building Features: A Colorado Case Study</td>
<td>Laura Bently, Scott Glick, and Kelly Strong</td>
</tr>
<tr>
<td>134</td>
<td>Californian Realtors’ Perceptions towards Energy-Efficient “Green” Housing</td>
<td>Sandy Bond</td>
</tr>
<tr>
<td>160</td>
<td>Is Green a Matter of Prime? Stylized Facts about the Location of Green Buildings</td>
<td>Thomas Braun and Sven Bienert</td>
</tr>
<tr>
<td>183</td>
<td>Assessing the Effectiveness of Mandating Energy Efficiency: Boulder, Colorado’s Implementation of SmartRegs</td>
<td>Scott Glick, Caroline M. Clevenger, and Mark Laverty</td>
</tr>
</tbody>
</table>
The Board of Directors of the American Real Estate Society extends its deep appreciation to:

- **University of San Diego**, Burnham-Moores Real Estate Center for its support of the editorial functions of the American Real Estate Society;
- **Florida Gulf Coast University**, for its support of the editorial functions of the American Real Estate Society;
- **Florida International University**, for its support of the Director of Publications functions of the American Real Estate Society; and
- **Kennedy Wilson**, for its support of the Executive Director functions of the American Real Estate Society.

**2016 Membership**

Academic ($175 print, $135 electronic), Professional ($350 print, $300 electronic), Academic Library ($675 print, $600 electronic), Corporate Library ($675 print, $600 electronic), Student or Retired Academic ($105 print, $85 electronic), Corporate ($675 print, $600 electronic), Sponsor ($1,500), Regent ($3,000) and President’s Council ($6,000). Additional membership options are available. See the 2016 Membership Form in the back of the journal. Checks should be made payable to ARES and correspondence should be addressed to: Diane Quarles, Clemson University, College of Business & Behavioral Science, Dept. of Finance, 300 Sirrine Hall, Clemson, SC 29634-1323. Phone: 864-656-1373; Fax: 864-656-7519. Website: www.ARESnet.org or equarle@clemson.edu.

The *Journal of Sustainable Real Estate* (1949-8276) is published annually by the American Real Estate Society at Clemson University, School of Business and Behavioral Science, Department of Finance, 300 Sirrine Hall, Clemson, SC 29634-1323. Postmaster, please send address changes to: Diane Quarles, Clemson University, School of Business and Behavioral Science, Department of Finance, 300 Sirrine Hall, Clemson, SC 29634-1323. Changes of address, claims and all correspondence dealing with subscriptions should be sent to Diane Quarles, Manager of Member Services, Clemson University, School of Business and Behavioral Science, Department of Finance, 300 Sirrine Hall, Clemson, SC, 29634-1323. Phone 864-656-1373, Fax 864-656-7519 or email equarle@clemson.edu. For more information, visit our website: www.ARESnet.org.

The ARES publications are copy edited and published by Kathryn Clark of Precision Write (katchlark@provide.net). The ARES publications are typeset by Pro-Composition, Inc. (jbrunner@pro-composition.com).
2015 American Real Estate Society

President’s Council
Altus Group/ARGUS Software
Appraisal Institute
CCIM Institute
Colvin Institute of Real Estate Development
Cornerstone Real Estate Advisers, Inc.
CoStar Group
Florida Atlantic University
Greenfield Advisors

Institutional Real Estate, Inc.
Prudential Real Estate Investors
REALTOR® University/National Association of Realtors® (NAR)
Royal Institution of Chartered Surveyors (RICS)
The Appraisal Foundation
The Appraisers Research Foundation (TARF)

Regents
Blackrock Financial Management
Carter Real Estate Center, College of Charleston
CBRE Econometric Advisors
Counselors of Real Estate (CRE)
Dividend Capital Research
Dr. P. Phillips School of Real Estate–University of Central Florida
Institute of Real Estate Management (IREM)

LaSalle Investment Management
National Association of Real Estate Investment Trusts (NAREIT)
National Investment Center for Seniors Housing & Care Industry (NIC)
Real Capital Analytics (RCA)
Sarasota Capital Strategies (SCS)
UBS

Sponsors
Bailard, Inc.
Building Owners & Managers Association (BOMA) International
Burnham-Moores Center for Real Estate–University of San Diego
California Association of REALTORS®
Daniel M. DiLella Center for Real Estate–Villanova University
Dearborn Real Estate Education
Emerald Group Publishing Ltd.
GIC Real Estate Pte.
International Council of Shopping Centers (ICSC)
Jerome Bain Real Estate Institute at Florida International University
Johns Hopkins-Carey Business School–Edward St. John Real Estate Program
Kennedy Wilson

Kornblau Real Estate Program–Virginia Commonwealth University
Master of Real Estate Development Program–Clemson University
Mortgage Bankers Association (MBA)
Murray H. Goodman Center for Real Estate Studies, Lehigh University
NAIOP
National Multifamily Housing Council (NMHC)
NYU Schack Institute of Real Estate
OnCourse Learning
Real Estate Center at DePaul University
Routledge
SNL Financial
University of Arizona–School of Landscape Architecture and Planning
USAA Real Estate Company
James R. Webb ARES Foundation

Endowed International Scholar Sponsorship
Arthur L. & Helen Beckett Schwartz
Michael, Ryan, and Evan Seiler

Endowed Doctoral Sponsorships
Youguo, Lucy, Michelle, and Mia Liang
Glenn R. and Jan H. Mueller
Theron R. and Susan L. Nelson
Michael J. and Vicky L. Seiler

Benefactors
William G. Hardin, III
Florida International University
Ronald Johnsey
Axiometrics, Inc.
John Kilpatrick
Greenfield Advisors, LLC
Steven Laposa
A&M Insight Center
Christopher A. Manning
Loyola Marymount University
Norman G. Miller
University of San Diego
Joseph L. Pagliari, Jr.
University of Chicago
Stephan A. Pyhrr
Kennedy Wilson
Raymond Torto
CBRE Econometric Advisors
Anthony Welch
Sarasota Capital Strategies
Robert White
Real Capital Analytics, Inc.
John E. Williams
Morehouse College–Emeritus
Richard Wincott
Altus Group/Argus Software
Elaine M. Worzala
College of Charleston

Distinguished Fellows
Joseph D. Albert
James Madison University–Emeritus
John D. Benjamin
American University–Emeritus
Don Dorechester
The Dorchester Group
Karl L. Guntermann
Arizona State University–Emeritus
David Harrison
University of Central Florida
Michael J. Highfield
Mississippi State University
G. Donald Jud
In Memoriam
Alex Klatskin
Forrgate Industrial Partners
Mark L. Levine
University of Denver
Joseph B. Lipscomb
Texas Christian University
Sean P. Salter
Middle Tennessee State University
Philip A. Seagraves
Middle Tennessee State University
G. Stacy Sirmans
Florida State University
Michael C. Truebstein
University of Lucerne

Fellows
Edward A. Barylka
East Tennessee State University
Marvin F. Christensen
Deutsche Asset & Wealthy Management
J. Reid Cummings
University of South Alabama
James R. DeLisle
University of Missouri
Geoffrey Dorman
Instutional Real Estate Inc.
Donald R. Epley
University of South Alabama
Karen M. Gibler
Georgia State University
Kimberly Goodwin
University of Southern Mississippi
Thomas W. Hamilton
Roosevelt University
Forrest E. Huffman
Temple University
L. Jide Iwarere  
Howard University  
Ken H. Johnson  
Florida Atlantic University  
Sunny Liston  
Marylhurst University  
Willard McIntosh  
USAA Real Estate Company  
Graeme Newell  
University of Western Sydney  
Rudy R. Robinson, III  
Austin Valuation Consultants  
Mauricio Rodriguez  
Texas Christian University  
Stephen E. Roula  
Roulae Global LLC  
Ronald C. Rutherford  
University of South Florida  
Karl-Werner Schulte  
University of Regensburg

Robert A. Simons  
Cleveland State University  
Thomas M. Springer  
Clemson University  
Mark A. Sundeman  
University of Memphis  
Grant I. Thrall  
Business Geography Advisors  
Ko Wang  
Johns Hopkins University  
H. Shelton Weeks  
Florida Gulf Coast University  
Margot B. Weinstein  
MW Leadership Consultants  
Daniel T. Winkler  
University of North Carolina–Greensboro  
Kimberly Winson-Geideman  
University of Melbourne  
James Young  
University of Auckland
JOSRE Advisory Board

Scott Anders
University of San Diego

Grant Austin
American Valuation, Inc.

Aaron Binkley
AMB Property

Jack Crews
Jones Lang LaSalle

Dale Dekker
Dekker/Perich/Sabatini

Brian Dunbar
Colorado State University

Richard Epstein
RNL Design

Andrew C. Florance
CoStar Group

Doug Gatlin
U.S. Green Building Council

Daniele Horton
Verdani Partners

Lydia Jacobs-Horton
Procter & Gamble (Retired)

Kent Jeffreys
Office of Global Public Policy
International Council of Shopping Centers

David Jellison
Liberty Property Trust

Stephen Kapp
Siemens Industry, Inc.

Charles Leitner III
Greenprint Foundation and RREEF

David Lorenz
Lorenz Property Advisors

L. Hunter Lovins
Natural Capitalism Solutions (NCS)

Asieh Mansour
The Townsend Group, LLC.

Scott Muldavin
The Muldavin Company, Inc.

David Pogue
CBRE

Nico Rottke
Ernst and Young, Real Estate

Jay Spivey
CoStar Group

Leanne Tobias
Malachite LLC

Cathy Turner
New Buildings Institute

Vance Voss
Principal Real Estate Investors

Alan Whitson
RPA

Sally Wilson
CBRE

Jim Young
Realcomm

Jerry Yudelson
Green Building and Sustainability Consultant
This issue has some seemingly narrow topics, but readers will be pleased to find a wealth of great literature reviews within some of the papers, like the one by Bond on Realtors perceptions. The paper by Robinson and McAllister, our lead paper, addresses some of the nuances in the commercial real estate market with respect to green premiums. In some markets, there is no premium, not necessarily because the market will not pay for better buildings but because the bar for high-quality institutional level buildings in major markets has now been raised substantially. Over time, our building stocks will get better and the premiums will disappear. We also have two papers from Africa, which were selected from a large group of submissions, suggesting increasing interest in sustainability in third world countries. We continue to have papers that address valuation and other policy issues or even training and implementation challenges. We hope a few of these are of interest and help promote a more sustainable world. Below are the papers in this issue, along with brief overviews of their content.

**Heterogeneous Price Premiums in Sustainable Real Estate? An Investigation of the Relation between Value and Price Premiums** by Spenser Robinson and Pat McAllister

Focusing on the voluntary LEED and ENERGY STAR environmental certification schemes in the United States, the authors investigate whether price premiums exist across all building value categories or are localized to specific value segments. They find that the largest value building segment does not demonstrate any price premiums, while the smallest value categories do.

**Incorporating Green Building Features and Initiatives into Commercial Property Valuation** by Saul Nurick, Karen Le Jeune, Emma Dawber, Ryan Flowers, and Jennifer Wilkinson

The rapid acceptance of green buildings internationally has led to awareness of green building features and initiatives (GBFIs) in the South African property industry; however, among South African valuers, it seems the awareness is still in its infancy. Interviews suggest that South Africa’s valuers require a great deal of education but are starting to become aware of green building features.

**The Relevance of Green Building Practice in Emerging Markets: A Perceptual Analysis of Commercial and Industrial Building Users in Ibadan, Nigeria** by A. Olaleye, T.O. Ayodele, and M.O. Komolafe

In this study, the authors examine the operational challenges of existing green building related features/systems to develop hypotheses about factors that will increase the demand for green buildings in less developed countries. They test these hypotheses by examining the potential green building advantages that will influence users’ adoption of green practices and their willingness to pay.

**Factors Influencing U.S. Homebuilders’ Adoption of Green Homebuilding Products** by Andrew R. Sanderford, Matthew J. Keefe, C. Theodore Koebel, and Andrew P. McCoy

While many researchers have analyzed the obstacles to the diffusion of innovation in building construction, little empirical evidence has been gathered about the
factors associated with U.S. homebuilders’ adoption of innovative building products. In this paper, the authors develop a theory-driven diffusion of the innovation conceptual model that drives homebuilders’ adoption of high performance building products.

**Measuring Highway (Noise) Impacts on House Prices Using Spatial Regression** by Marcus T. Allen, Grant W. Austin and Mushfiq Swaleheen

Generally accepted real estate valuation theory, augmented by ample empirical evidence, supports the notion of significant impacts on prices of residential properties near highways. Houses adjacent to highways are exposed to potentially increased traffic noise, although these homeowners may benefit from increased accessibility to highway systems. This study is prompted by a massive new highway construction project (25 miles) that will complete a 110-mile beltway around the Orlando, Florida metropolitan area. The results indicate significant price discounts for houses adjacent to highways, houses near high-traffic highways, and houses farther from highway on- ramps, but no significant impact related to distances from houses to highways or sound barrier walls.

**LEED Certification of Campus Buildings: A Cost-Benefit Approach** by Erin A. Hopkins

This is the first comprehensive cost-benefit analysis of Leadership in Energy and Environmental Design (LEED) buildings certified within the higher education sector. Sixteen institutions of higher education were surveyed with the findings focused on the upfront green premium and down the line energy savings. The net present value and internal rate of return are analyzed.

**Appraising Sustainable Building Features: A Colorado Case Study** by Laura Bently, Scott Glick, and Kelly Strong

The authors investigate the current status of sustainable value integration in Colorado’s real estate markets, an area with limited current/historical value attributed to sustainability. The property appraiser has an opportunistic position to influence stakeholders and potentially increase demand for sustainable building. The appraisal process, necessary inputs, and rules and regulations were studied. Appraisers seem to be catching on to the value impact of sustainable features and design.

**Californian Realtors’ Perceptions towards Energy-Efficient “Green” Housing** by Sandy Bond

Realtors are seen as important enablers of behavior change toward a low-carbon future through the communication of sustainability measures to home buyers and sellers. In 2012/2013, research was conducted to assess Californian Realtors’ knowledge of, and perceptions towards, sustainable housing using an online survey instrument. What consumers and Realtors consider important differ, suggesting the need for more education within the Realtors and to the public at large. With more education, we will certainly see demand for sustainable homes increase, a sector lagging far behind the office sector.

**Assessing the Effectiveness of Mandating Energy Efficiency: Boulder, Colorado’s Implementation of SmartRegs** by Scott Glick, Caroline M. Clevenger, Mark Laverty
On January 3, 2011, the City of Boulder, Colorado implemented the SmartRegs Ordinances updating the city’s housing and rental licensing code by mandating baseline efficiency requirements for rental housing units. The authors examine the SmartRegs inspector training program relative to the prescriptive path checklist for compliance and quality assurance controls from inception through the first quarter of 2014. A key finding suggests that discrepancies in quality control audits may be the result of the training and certification program not adequately preparing inspectors for the field observations needed to competently complete inspections. This may be due to improper planning of implementation policies.