The 2008-2010 Progress Report of the National Center for Smart Growth Research and Education at the University of Maryland

In cooperation with
The School of Architecture, Planning and Preservation
The College of Agriculture and Natural Resources
The School of Engineering
The School of Public Policy
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MESSAGE FROM THE EXECUTIVE DIRECTOR

Thank you for taking time to review the progress report of the National Center for Smart Growth Research and Education (NCSG). Though its preparation is not delightful, and its completion is rarely on time, this report remains a useful record of work by faculty and staff of the National Center for Smart Growth. For whom it is useful is not entirely clear. We like to think the report is useful to our executive committee as a demonstration of what we have accomplished; to scholars, policy makers and practitioners as a gateway to more information on particular subjects; and to random surfers who stumble across this document on the web and for some reason want to know what we've been up to for the last two years.

Perhaps most importantly, however, this document is useful to us, as a record of what we have done, as a basis for assessing our performance, and for clues regarding where we should go from here. I'm confident this document serves this last purpose well, but I also hope it serves a purpose for others as well, whatever that purpose may be.

This is the fourth of these progress reports, and they all begin with a short message from the director. But since it has now been ten years since the NCSG was established, I want to take some time to reflect on where we have been and where I think we are going—again perhaps more for ourselves than for anyone else.

Although the Center was first established in 2000, I first arrived on the College Park Campus as Research Director in 2002. When Tom Downs took the position of Director, the NCSG was little more than the office he shared with Katie Petrone, his administrative assistant. Tom had done the initial work of creating a web presence, adopting a logo, and forming an advisory panel. But the list of NCSG activities was only modestly enhanced by the projects I brought from the University of Illinois.

Although the Smart Growth climate was chilly in the early years of the Bush administration, the set of NCSG activities grew rapidly as it added talented staff. Kelly Clifton joined the Center at nearly the same time as I and brought with her a set of activities focused on nonmotorized travel and physical activity. Along with Carolyn Voorhees of the UMD Department of Public and Community Health, Kelly worked on several projects funded by the Robert Wood Johnson Foundation that led to pioneering work on pedestrian audits and eventually led to the research agenda on land use and transportation that has continued since her departure for Portland State in 2009.

Reid Ewing was the next to join the Center and it's difficult to imagine another individual who could have given the Center more immediate credibility and name recognition. Soon after he arrived Reid's work on the relationship between sprawl and obesity made the headlines of countless newspapers across the county. Not long thereafter, and only shortly before he left for the University of Utah, Reid again made national news with the release of Growing Cooler, his book on sprawl and climate change.

John Frece joined the Center in 2003 after serving as spokesman for Governor Parris Glendening on smart growth issues. John now heads the U.S. Environmental Protection Agency's Office of Sustainability. Even while in the Governor's office, John worked to embed the NCSG in state land use policy making. It was John's idea to make the NCSG director a member of the Smart Growth subcabinet, a subtle appointment but one that symbolically and substantively embedded the work of the Center in the state's longstanding leadership on land use issues. John also played a critical role in the organization and execution of six "Reality Check" exercises that kept smart growth issues before the citizens of the region and laid the foundation for the still continuing Maryland Scenario Project.

Chengri Ding joined the Center in 2003 to launch the China Land program for the Lincoln Institute of Land Policy. For the following five years, Chengri organized countless training sessions across China and in College Park, launched a research agenda pursued by both Chinese and North American scholars, and helped to launch the career of a generation of new land policy scholars. Among the highlights of this early work was a visioning exercise for the City of Beijing, the first time a contingent of foreign experts had performed such an exercise in over 50 years.

Over the same period, the Center was extremely well served by three postdoctoral scholars all from the planning program at the University of Illinois. Yan Song, Jungyul Sohn, and Nikhil Kaza all

launched their now very successful careers at the NCSG while establishing a data and modeling infrastructure that serves as the foundation of much of the work at the Center today. In addition, the Center has benefitted greatly from faculty with appointments outside the School of Architecture, Planning, and Presentation. Antonio Bento, now at Cornell University held a split appointment as an assistant professor in the Center and the School of Public Policy from 2004 to 2007. Charles Towe and Cinzia Cirillo, assistant professors in the departments of Agricultural Economics and Civil and Environmental Engineering, respectively, have had quarter time appointments in the Center since 2008. Both have made substantial contributions to Center efforts in transportation and land use modeling.

One of the ways the NCSG has grown is by adding subcenters of activity. Under the leadership of Dan Nees, the Environmental Finance Center joined the NCSG in 2007. Funded by the EPA and a variety of other sources, the EFC brought to the NCSG expertise in environmental finance, natural resource—especially water resource—management, and a great deal of experience providing technical assistance to state and local governments throughout EPA Region III. The EFC is now ably directed by Joanne Throwe and her staff which includes Jennifer Cotting, Meghan Hughes, and Liz Fried. Joe Dillon, on leave from EPA, also spent two years with EFC helping to launch the certificate program in environmental finance offered by the School of Public Policy.

The Transportation Policy Research Group was established as a cooperative venture between the NCSG and the Maryland Department of Transportation. This three-year agreement was established in part to capitalize and expand the opportunities created by the statewide transportation model built by NCSG staff under contract with the Maryland State Highway Administration. Under these agreements the Center has added Xin Ye and Sabya Mishra, both with PhDs in engineering and talented transportation modelers. The TPRG is led by Fred Ducca, a thirty year veteran of the Federal Highway Administration and expert in transportation modeling. Although transportation and land use has always been a topic of interest to NCSG staff, the TPRG is clearly raising the technical quality of the work to unsurpassed levels.

The Center for the Use of Sustainable Practice was established in 2009 as a cooperative venture between the NCSG and the School of Architecture, Planning, and Preservation. CUSP was established to build on the success of previous competitions in the Solar Decathlon and to pioneer new ground in building energy efficiency and sustainable development. CUSP is led by Associate Professor of Architecture Amy Gardner who will be joined by former dean Garth Rockcastle when he returns from sabbatical in January 2011. CUSP extends the scope of the NCSG not only to the dominant and growing field of sustainability but provides a design dimension heretofore lacking in the research portfolio.

In the past couple of years, the NCSG has been fortunate to attract considerable new talent. Patty Gallivan, from the Baltimore Neighborhood Indicators project, runs our GIS lab, Cynthia Williams handles our books, and Anne Petrone handles everything else. This January we look forward to adding Casey Dawkins from Virginia Tech and Hiro Iseki from the University of New Orleans to the NCSG faculty. Both will have half time appointments in the Urban Studies and Planning Program. We are excited about great new ideas and interesting work each of these newcomers will bring to the collective effort.

The last decade has certainly been interesting. Smart Growth has gone from controversial new idea to perhaps the most familiar element of a larger sustainability agenda. It's not that smart growth issues have been resolved, it's more that smart growth is now recognized as only part—but an important part—of a larger effort to conserve energy, protect the environment, and enhance the quality of life for all members of society. Such recognition is a real measure of progress.

The National Center for Smart Growth enters its second decade with a new set of challenges. There is less need to demonstrate that growth can be better planned and managed and a greater need for information on how to do so. Fortunately we are well poised for this task. Although we have lost irreplaceable people, we have added considerable new talent, we have formed strong self-sustaining subcenters, and we have built considerable data, analytical, and network capital. With these considerable assets, I'm excited at the thought of what we might accomplish over the next decade.

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1 NCSG History and Mission

The National Center for Smart Growth Research and Education (NCSG) was established in 2000 as a direct result of the rapidly expanding national and international interest in improving land-use management through efforts collectively known by the term "Smart Growth." The NCSG is a cooperative venture of four schools on the University of Maryland's College Park campus; Agriculture and Natural Resources; Architecture, Planning and Preservation; Engineering; and Public Policy. The NCSG was created at least in part due to the national reputation of the State of Maryland's 1997 Smart Growth and Neighborhood Conservation Program and a desire by the University to build on the national and even international visibility that resulted from that legislation and the efforts that stemmed from those enactments.

The concept of a Center for Smart Growth originated with Jim Cohen, who saw both a need and an opportunity to develop an impartial, objective, and multi-disciplinary approach to improve the understanding of the complex Smart Growth strategies sweeping the nation at the start of the 21st century. From the outset, the Center was envisioned as an institution that would assess, and assist where possible, the implementation of the Maryland Smart Growth initiative, but which would also become a national resource for research and education on Smart Growth and related land-use issues and strategies.

The Center's mission is to assist the University of Maryland to become nationally and internationally recognized as a leader in Smart Growth-related research and education. The Center achieves its mission by bringing the diverse resources of the University of Maryland, and a network of national experts to bear on issues of land development, resource preservation and urban growth through interdisciplinary research, public outreach and education. This approach recognizes that work on these interwoven issues directly affects the nature of communities, the landscape and environment and ultimately, the state's quality of life.

This mission translates into two fundamental goals:

1. to fill the critical gaps in the research and available data related to the underlying assumptions and effects of "smart growth" including the effectiveness of state and local growth management initiatives; and,

2. to fill an equally critical gap in available education and training for decision-makers who need new ideas and tools for adopting cross-disciplinary and integrated approaches to managing growth, land-use planning, problem-solving and implementation.

2 NCSG Focus Centers

National Center for Smart Growth Research and Education

The primary focus of the NCSG continues to be research. There are, however, two major initiatives of the NCSG that are worth highlighting: the Maryland Scenario Project and the Maryland Smart Growth Indicator Project.

The Maryland Scenario Project is a long-range examination of alternative development trends that employs multisector modeling to explore scenarios for the state of Maryland. For this project, the NCSG had previously convened an advisory group of nearly 40 technical land use and planning experts from across Maryland to identify the future driving forces of Maryland's growth. The group has also created alternative scenarios for future growth in Maryland, based on the interactions of the driving forces of growth with potential local and state policies. The scenarios include different assumptions about background conditions. Among the scenarios are options that move policy more in the direction of sustainable development and smart growth; a full buildout scenario in which every local jurisdiction develops according to existing zoning plans; and a climate change scenario in which portions of the state are no longer habitable due to rising sea levels. The project's intent was not to create a single, predictive model of that growth, but to illustrate – with technical rigor—ways the state might develop under

alternative sets of assumptions about markets, policies, and public investments.

Over the last two years, the NCSG has worked with partners and consultants to refine the scenarios, develop a set of integrated models, and evaluate the impacts of each scenario on a series of indicators. Included in the modeling framework are energy, water quality, land use, and economic models as well as Maryland's first statewide transportation model, the development of which is being led by the TPRG.

The Maryland Smart Growth Indicators Project represents the NCSG's effort to monitor the progress of the state's Smart Growth Program. The project, which has primarily been funded by the Abell Foundation, has involved the collection of over 100 indicators of growth in categories of: population, employment, transportation, development patterns, housing, and the environment/natural areas. The NCSG anticipates releasing a report highlighting its findings on key indicators by the end of 2010. The indicator data and additional information on the project can be found at www.indicatorproject.com.

Environmental Finance Center

In an effort to expand the capacity of the NCSG beyond just land use research and education and to provide more technical and public education and outreach assistance to individual communities, the NCSG brought the EFC under its administrative umbrella in February 2007.

The EFC was created with support from the EPA to assist communities in identifying innovative and sustainable ways of paying for environmental protection efforts. For this purpose, the EFC provides technical assistance as well as training and public outreach typically in the form of workshops, charrettes and conferences, designed to promote the more effective management of the costs associated with resource protection activities. The EFC is led by Director Joanne Throwe. Staff members include Assistant Director Jennifer Cotting, Program Managers Megan Hughes and Lisbeth Fried, students Catherine Kapura, Stephanie Praus, and Nora Somoygi, and Joe Dillon, who is on loan to the EFC from the U.S. Environmental Protection Agency.

Over the course of fiscal year 2009, the EFC assisted local governments throughout the mid-Atlantic region with a variety of resource protection projects. Highlights include facilitation of the Eastern Shore Collaborative to stimulate dialogue among farmers and watershed organizations, watershed planning in the Cacapon and Lost Rivers Land Trust and Sassafras River watersheds, stormwater finance training for West Virginia stormwater practitioners, coordination services for Maryland land trusts, and improving air quality at the Port of Baltimore.

Green infrastructure was also been a major focus of EFC's FY 2009 activities. Because green infrastructure has the capacity to address multiple community priorities simultaneously, it provides an effective framework for coupling community planning and resource protection efforts. Activities completed under the Green Infrastructure Initiative umbrella include support for urban forestry in Region 3 communities, participation in the Source Water Collaborative as a representative of the EFC Network, and presenting to and networking with Maryland Municipal League officials at the fall 2008 conference.

The EFC continues to maintain up-to-date web-based offerings including the Greenways Financing Toolbox, a series of Bay-related funding matrices, and application and programmatic materials for the Port of Baltimore diesel emissions reduction program. The EFC also continues to administer Maryland FoodTrader, Maryland AgTrader, Delaware FoodTrader, and Delaware AgTrader.

Finally, the EFC, through the Environmental Leadership Program, developed outreach and education programs that focus on the key issues related to environmental finance, including the capacity of communities, institutions, and leaders to develop sustainable environmental initiatives. The Environmental Leadership Program housed the Environmental Finance Certificate Program, the Green Infrastructure Seminar Series, and the Sustainable Infrastructure Seminar Series.

Transportation Policy Research Group

Established in 2009, the TPRG is a joint effort between the University of Maryland and the Maryland Department of Transportation. The mission of the TPRG is to explore new approaches to transportation policies that provide citizens with economically and environmentally sustainable choices that increase mobility, increase accessibility, promote sound urban development and promote redevelopment. Current TPRG research focuses on transit-oriented development (TOD); effective-

ness of congestion pricing and other traffic management tools; effects of transportation investment on urban growth, land use and the environment; and the interaction of transportation, economics and finance.

Much of the work of the TPRG is based on the Maryland State Transportation model built with funding from the Maryland State Highway Administration. This sketch-level, four-step, three-stage model is the first ever built for the state of Maryland and will be used by the Maryland State Highway Administration for a variety of project- and corridor-level transportation studies. The model also serves as the foundation for much of the modeling platform that underlies the Maryland Scenario Project.

In November 2009, the TPRG organized and hosted a symposium entitled "Moving Maryland: A symposium on transportation, growth, and the environment." The symposium brought together representatives from the Maryland legislature, the Departments of Transportation and Environment, and other interested parties to discuss policies that address vehicle miles traveled and other pressing transportation issues. Terry Moore presented the keynote address.

Center for the Use of Sustainable Practices

CUSP was founded at the University of Maryland's School of Architecture, Planning and Preservation as an inter- and multidisciplinary center for the design and research of sustainable practices for buildings, communities and cities. CUSP is led by Associate Professor Amy Gardner. Its staff includes former Dean Garth Rockcastle, Cari Varner and Peter James.

CUSP joins the National Center for Smart Growth Research and Education and the Environmental Finance Center as a sister center to explore research, design, education and public outreach activities related to sustainable practices at the scale of the building, the community and the city.

CUSP's mission is to foster the integrated practice necessary for current and future practitioners who are charged with creating built environments and who must cross generational and academic-industry boundaries. Building on the basis of such multi-disciplinary collaboration, joining with other Schools and Colleges within the University as well as affiliated colleagues in the professional community, CUSP provides a unified venue for design, research and public outreach through integrated and inter-disciplinary activities not afforded by typical architectural or engineering professional services.

The objectives are to employ CUSP resources to assist clients in achieving economic and equitable sustainable development and design; to serve as an informational resource center related to apply sustainable design solutions to real life projects; to advance sustainable design research; and to educate students and the public-at-large on sustainable design best practices.

Over the past two years, CUSP has made significant progress in expanding its capacity. In 2010 CUSP initiated an urban design training program in St. Mary's County, Maryland. As part of the County's Growth Area Initiative, CUSP, in collaboration with Maryland SeaGrant and EFC, developed a monthly training program to educate planning commissioners on smart growth and urban design principles. Using the expertise found at the University of Maryland, these sessions continue to provide valuable information to St. Mary's County to inform its development process and ensure that a quality built environment serves as an amenity for years to come.

More recently, a team of University of Maryland students, faculty and mentors led by CUSP has earned one of 20 coveted spots in the elite international U.S. Department of Energy Solar Decathlon 2011 Competition. It's the fourth time the University of Maryland has reached the finals in this competition. Over 300 students have signed on to participate. CUSP is collaborating with faculty and students drawn from Architecture, Engineering, Agriculture and Natural Resources, Communications and Bioengineering. The solar house, WaterShed, will be designed and constructed over the next year. It will be displayed in the National Mall in October 2011. Over the past year, CUSP has developed an extensive visioning and planning process, which has allowed it to position itself as a competitive resource center on sustainable design. Efforts have included national presentations, national grant applications, branding and website design.

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4 Education & Training

Governors' Institute on Community Design

Between 2005 and 2009, the National Center for Smart Growth Research and Education was a partner with the Smart Growth Leadership Institute in Washington, D.C. developing and presenting workshops for governors who are interested in issues related to growth, development and community design.

This project, called the Governors' Institute on Community Design (GICD) was modeled after the successful Mayors' Institute on City Design. It was funded by the National Endowment for the Arts and the U.S. Environmental Protection Agency (U.S. EPA).

Previously, GICD conducted workshops in eight states: Rhode Island, Virginia, Arizona, Maryland, Delaware, Wyoming, New Mexico and Iowa. In most cases, the GID staff worked with the Governors' staffs in those states to identify an issue related to growth and development that the respective governors wished to address. GICD staff then identified and recruited national experts to work closely with the Governor, his/her cabinet, and selected staff to devise alternatives solutions. In one instance, the Governor of Wyoming opted to use the GICD to assist in developing a public forum on growth and development issues rather than employ a private consultant for his staff.

Since our last progress report in 2008, the National Center for Smart Growth Research and Education participated in three GICD workshops. These were the following:

- *Smart Growth and Forest Fires - Governor's Office, Montana, June 17-19, 2009.*
- *Federal Government Sustainability Initiative, 37 States Participated, October 27, 2009.*
- *Smart Growth and Transportation - Governor's Office, Delaware, January 4-5, 2010.*

5 Faculty & Staff Biographies

Administrative Staff

Ann Petrone has been with the University of Maryland for 25 years. For 17 of those years, she has been an assistant to the Dean of the School of Architecture, Planning and Preservation. She joined the National Center for Smart Growth in August 2008. Prior to her employment at the University of Maryland, Ms. Petrone was in private business owning her own seafood business and restaurant. She is a graduate of the University of Maryland, as are her three children. She resides in Columbia, Maryland.

Cynthia Williams is the Grants Contracting Officer for the National Center for Smart Growth and School of Architecture Planning and Preservation. She has worked in this capacity since 2008. Ms. Williams has worked for the University of Maryland for 16 years in a variety of capacities, including an Accountant in the Contract Grant Accounting Office (2005-2008); Business Service Specialist in the Department of Criminology and Criminal Justice (1999-2005); and manager of operational accounting within the Center for Institutional Reform (1995-1999); and previously as staff accountant with that organization (1994-1995). Ms. Williams has a Bachelor's Degree from the University of Maryland University College.

National Center for Smart Growth Research and Education

Gerrit-Jan Knaap, Executive Director of the National Center for Smart Growth Research and Education, is an economist and professor of Urban Studies and Planning in the University of Maryland's School of Architecture, Planning and Preservation. He also serves as an ex officio member of the Governor's Smart Growth Sub-Cabinet and the Maryland Sustainable Growth Commission.

Dr. Knaap is the author, coauthor, or coeditor of more than 75 articles and seven books including: *Land Market Monitoring for Smart Urban Growth; Environmental Program Evaluation; Spatial Development in Indonesia; The Regulated Landscape: Lessons on State Land Use Planning from Oregon; Partnership for Smart Growth; University-Community Collaboration for Better Public Places; Incentives, Regulations and Plans: The Role of States and Nation-States in Smart Growth Planning; and Planning in the Face of Markets: A guide to Land Use Planning in a Market Economy*.

Dr. Knaap received the "2006 Outstanding Planner Award" from the Maryland Chapter of the American Planning Association. He earned a B.S. from Willamette University. His M.S. and Ph.D. are from the University of Oregon. Dr. Knaap also received post-doctoral training at the University of Wisconsin-Madison. Dr. Knaap's degrees are all in economics.

Martin A. Bierbaum joined the National Center for Smart Growth in July 2009, after serving in a number of policy-making posts within New Jersey State government for more than 17 years. Dr. Bierbaum holds a Ph.D. in Urban Planning and a J.D. degree, both from Rutgers University. Among the posts that he held in New Jersey State government were Assistant Director of the Office of State Planning (1987-1991); Director of Environmental Planning and Director of Coastal Resources Planning (1991-1995); New Jersey Department of Environmental Protection Quality Management Coordinator (1995-1998); Director of the State Plan Implementation Team (1998-2002); and Deputy Policy Director of the Governor's Policy Office (2002-2004) Dr. Bierbaum also served on the New Jersey Redevelopment Commission (1995-1998); on the New Jersey State Lakes Commission (1998-2002); on the Lake Hopatcong Regional Planning Commission (1999-2002); and the New Jersey State Planning Commission (1999-2002).

Before coming to the National Center for Smart Growth, Dr. Bierbaum established and directed the Municipal Land Use Center at The College of New Jersey (2004-2009). That Center was established with Federal and state funds and in turn provided financial and technical assistance to enhance the planning capacity of counties and municipalities throughout the State of New Jersey.

Dr. Bierbaum has written extensively about the New Jersey State Planning experience. He has also received recognition for his planning efforts including awards for "outstanding environmental planning" from the New Jersey Chapter of the American Planning Association (1995); a "distinguished leadership in planning" award from the New Jersey Chapter of the American Planning Association (2006); and a "lifetime achievement in planning" award

from the New Jersey Planning Officials (2010). In 2008, Dr. Bierbaum was enlisted to write the third iteration of the New Jersey State Development and Redevelopment Plan by the New Jersey State Planning Commission. He submitted the completed State Plan to the State Planning Commission in February 2009. That State Plan is pending approval by the New Jersey State Planning Commission.

Chengri Ding is associate professor of Urban Studies and Planning and Director of the Chinese Land Policy Program, co-sponsored by the University of Maryland and the Lincoln Institute of Land Policy. In 2009, he was also named as Associate Dean to the School of Architecture, Planning and Preservation. Dr. Ding's research interests include urban economics, growth management, housing and land studies and the application of quantitative methods and GIS to issues in planning and public policy. He holds a B.S. from Beijing Normal University; an M.S. from the Chinese Academy of Sciences; and a Ph.D. from the University of Illinois at Urbana-Champaign in regional planning.

Fred Ducca is Director of the TPRG at the NCSG. Dr. Ducca has 27 years of experience in research, development, deployment and training in travel forecasting methods and procedures, including extensive experience providing technical assistance to state and local governments on travel forecasting issues. While with the Federal Highway Administration (FHWA), Dr. Ducca managed the Travel Model Improvement Program (TMIP). This program advanced both the state of the art and state of the practice in travel forecasting. Dr. Ducca has a B.S. in mathematics from St. Peter's College, an MBA from the University of Pennsylvania and a Ph.D. in City Planning, also from the University of Pennsylvania. He has worked in both private consulting and the public sector, working for nearly three decades for the FHWA.

Sabyasachee Misrha is a faculty research associate with the TPRG at the NCSG. He is currently working on a Maryland Statewide Transportation Model. Prior to joining TPRG, Sabya worked on a number of projects including travel demand modeling for Southeast Michigan, Light Rail Transit, Transit-oriented Development, Safety Improvements for Urban Arterials, Incident Management, and Advanced Traveler Information Systems. His research work is published in national and international journals including those of the American Society of Civil Engineers (ASCE), Transportation Research Part A – Practice and Policy, and Transportation Research Board (TRB). He presented articles in Annual Meetings of TRB, World Conference on Transport Research (WCTR), International Conference on Transport Economics, and International Symposium on Freeway and Tollway Operations. He is a member of the TRB Transportation Economics (ABE20) committee and a reviewer of TRB papers submitted for possible publication and presentation.

Cinzia Cirillo is an assistant professor in the Department of Civil and Environmental Engineering. She became a member of the Center's research faculty in 2008. She holds an M.S. degree in engineering from the University of Naples (Italy), and a Ph.D. from the University of Torino (Italy). Her research interests include the following: discrete choice analysis; advanced demand modeling; activity based models; revealed and stated preference surveys; large-scale model systems; and value-time studies.

Tracy Gordon researches topics in state and local public finance, political economy, and urban economics. Dr. Gordon teaches courses in public financial management and tax policy at the Maryland School of Public Policy. She is an affiliated scholar with the Urban Institute, an adjunct fellow at the Public Policy Institute of California, and a faculty associate of the NCSG and the Maryland Population Research Center. She has authored reports and journal articles on state and local budgeting, local property taxes, the local initiative process, and so-called "private governments" or homeowner associations in planned developments. She holds a Ph.D. in public policy with a concurrent M.A. in economics from the University of California, Berkeley.

Charles Towe is an assistant research professor at the National Center for Smart Growth Research and Education and is an assistant professor in the Department of Agricultural and Resource Economics. His fields of interest include behavioral economics, environmental economics and policy, and the economics of land use and land conversion decisions. He has a publication history in top academic journals and field journals including Econometrica and the American Journal of Agricultural Economics. Dr. Towe is an environmental economist who earned his Ph.D. at the University of Maryland in Agricultural and Resource Economics. He also holds degrees in Economics from Tufts University and the University of North Carolina at Asheville.

Xin Ye is a faculty research associate at the Center. He received his bachelor

degree in Civil Engineering from Tongji University, Shanghai, China. He received his M.S. and Ph.D. degrees in Transportation Engineering from the University of South Florida. He also received post-doctoral training at Arizona State University. Xin Ye's previous research was mainly focused on econometric modeling methodology, analyzing activity, travel and time-use behaviors. He also has experience in modeling analysis of traffic crash frequency and severity. More recently, he entered the area of population synthesis and investigated new algorithms for generating synthetic populations in a more sophisticated and efficient way. Currently, his major research effort at the Center is to aid in developing and implementing a statewide travel demand model for Maryland.

PhD Students

- Gulsah Akar
- Carolina Burnier
- Chris Dorney
- Selma Lewis
- Rebecca Lewis
- Chao Liu
- Thomas Martois
- Yi Niu
- Jung Ho Shin
- Andi Livi-Smith
- Rui Sun
- Xingshuo Zhao

Masters Students

- Rina Brule
- Cathy Dowd
- Matt Frost
- Steve Gehrke
- Kyla Gregoire
- Ray Hayhurst
- Shuo Haung
- Matt Johnson
- Doug Kampe
- Senait Kassa
- Amber Lefsted
- Allen Lo
- Chris Loos
- Katie Michel
- Stacey Oscavich
- Lilly Shoup
- Bhuwan Thapa
- Greg Vernon

ENVIRONMENTAL FINANCE CENTER

Joanne Throwe is Director of the EFC. Hired in 2005 as the EFC's Agricultural Program Leader, Joanne Throwe became Assistant Director in 2007, Associate Director in 2008, and Director in 2009. In addition, she completed an 18-month assignment working with USDA/CSREES as shared-faculty to assist in the coordination of special agriculture projects. Ms. Throwe works with communities in the Mid-Atlantic region implementing innovative financing solutions for environmental protection. Her work experience includes extensive knowledge about agriculture, green infrastructure, biofuels, ecosystem services and solid waste management. Prior to joining the EFC, Ms. Throwe spent several years as a Development Resource Specialist at USDA's Foreign Agriculture Service and two years as an Agriculture Extension Agent for Peace Corps in the South Pacific. She holds a M.A. in Public Policy and Private Enterprise from the University of Maryland.

Jennifer Cotting joined the EFC at the University of Maryland in 2004 to manage an EPA funded program designed to help communities and organizations in Region 3 overcome barriers to implementing and financing their watershed protection efforts. As a Program Manager she coordinated a number of the EFC's core programs, with a particular focus on urban greening, tree canopy, and green infrastructure. Her current work as Assistant Director includes these program management tasks, as well as responsibilities for the day-to-day operations of the center and the management of staff and student employees. In addition, Ms. Cotting serves as the EFC's representative to the Community of Practice, as well as the Source Water Collaborative. Prior to joining the EFC, Ms. Cotting worked as an independent consultant developing and implementing environmentally based education and outreach programs for nonprofit organizations and government agencies. She received her M.S. in Sustainable Development and Conservation Biology from the University of Maryland and her B.A. in Communications from Marymount University.

Megan Hughes came to the EFC from Bowling Green State University in Bowling Green, Ohio, where she served for four years as an Instructor and Internship Coordinator for the Center for Environmental Programs. In this capacity, she taught undergraduates a variety of environmental topics including human population growth, biodiversity, land use, water, and climate disruption and focused on research, writing, and critical-thinking strategies. Prior to accepting this Instructorship, Ms. Hughes worked for two years with the Chapel Hill, NC, firm Environmental Consultants and Research (EC/R, Inc.) as a contractor to the Environmental Protection Agency Office of Air Quality Planning

and Standards (OAQPS). Megan received her Master of Environmental Management degree from Duke University's Nicholas School of the Environment and Earth Sciences and a Bachelor of Arts Degree in Environmental Studies from the University of North Carolina at Wilmington.

Liz Fried is a Program Manager for the Environmental Finance Center at the University of Maryland. Prior to joining the staff in September 2009, she worked as a contractor for the EFC beginning in January 2008. Her current responsibilities include managing the grant application process for the Harbor Craft and Locomotive sub-programs of the Port of Baltimore Clean Diesel Program, logistical arrangements for the Environmental Finance Center Program Managers' Retreat and Chesapeake Bay Watershed Assistance Collaborative communication efforts. Ms. Fried is a former Certified Meeting Professional (CMP) with more than seven years of experience planning a wide variety of meetings, conferences and events for The National Association of Securities Dealers (NASD, Inc.), The Nasdaq Stock Market, The American Society of Civil Engineers (ASCE) and The Society of Fire Protection Engineers (SFPE). She holds a Master of Public Affairs from Indiana University's School of Public and Environmental Affairs (SPEA) and a BA from Centre College, Danville, Kentucky.

CENTER FOR USABLE SUSTAINABLE PRACTICE

Amy Gardner is Director of CUSP and has been on the University of Maryland School of Architecture, Planning and Preservation faculty since 1989. She became a tenured Associate Professor in 1998. She is a licensed architect in the State of Maryland and the District of Columbia. Professor Gardner is a member of the American Institute of Architects (AIA), and is a LEED Accredited Professional. With faculty and professional partners, Gardner has led the School's Competitions Studio, a design winning eight ACSA student awards; the academic Ideas Competition for the Washington DC Convention Center; third place in the Western Maryland Welcome / Sustainable Design Center, and one of four Finalist awards in the Kingman Island Environmental Education Center Competition. Most recently, Gardner was the lead faculty adviser and principal investigator for the University of Maryland's LEAFHouse entry to the 2007 Department of Energy Solar Decathlon. The LEAFHouse Team, an interdisciplinary group of students, faculty, professional and trade mentors, garnered second place overall and many awards in the intense competition with 19 other universities. Professor Gardner holds a B.S. in Architecture and an M.Arch. from the University of Virginia.

Cari Varner is a Ph.D. student in the University of Maryland's Urban and Regional Planning and Design Program. In 2009, Ms. Varner was selected as an "Emerging Leader in Sustainable Design" by the Design Futures Council. Prior to becoming a student at the University of Maryland, Ms. Varner was the Assistant Director of the Carl Small Town Center, a community design center at Mississippi State University's School of Architecture. Cari holds a B.S. in Design and Environmental Analysis from Cornell University and a M.S. in Environmental Policy and Behavior and a Master of Urban Planning, both from the University of Michigan.

6 AFFILIATE FACULTY

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