

2010-2012 Progress Report

**National Center for Smart Growth
Research and Education**

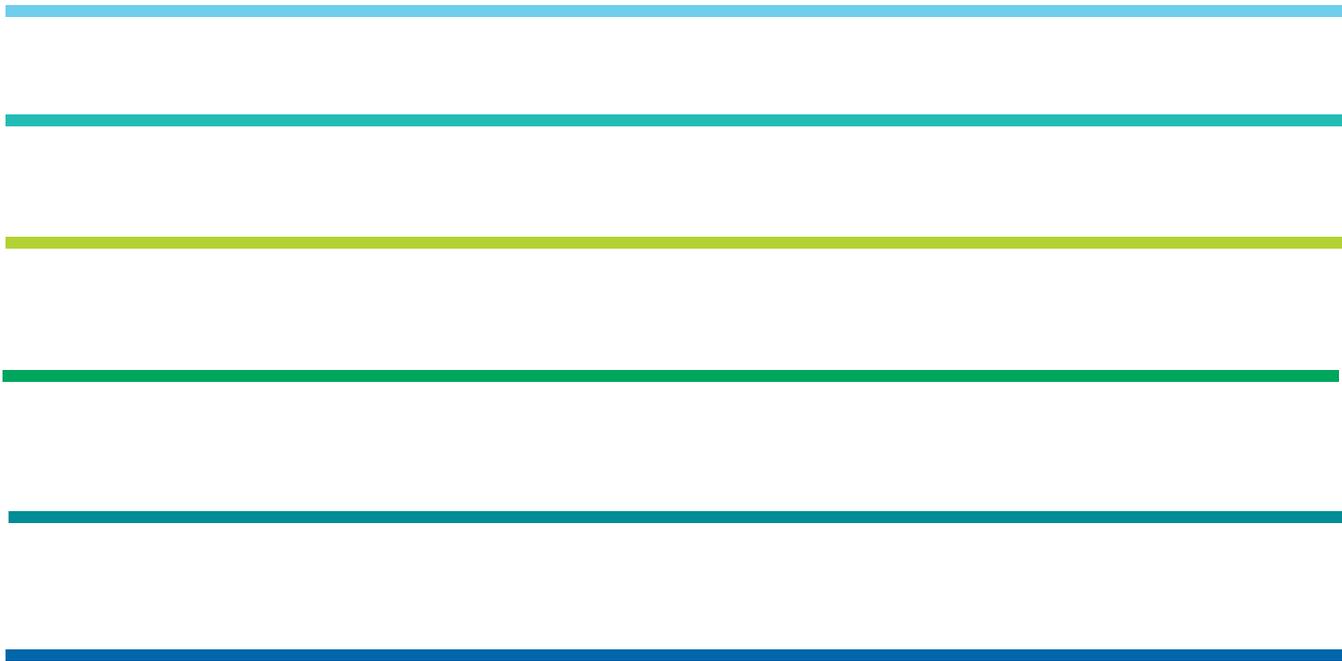


Table of Contents

	<i>Letter from the Director</i>	4
	<i>History and Mission</i>	6
	<i>Focus Centers</i>	9
	<i>National Center for Smart Growth</i>	9
	<i>Environmental Finance Center</i>	12
	<i>Transportation Policy Research Group</i>	14
	<i>Center for Sustainable Use and Practice</i>	15
	<i>Housing Policy Group</i>	16
	<i>Planning and Design Center</i>	17
	<i>Publications at NCSG</i> <i>Publications by the staff of NCSG</i>	19
	<i>People at NCSG</i>	24



Thank you for taking time to examine the 2010-2012 Progress Report of the National Center for Smart Growth Research and Education. While our mission of conducting research and offering educational programs on topics that pertain to Smart Growth has not changed, staff and focus areas of course do change. At present we have four faculty with joint appointments in the Urban Studies and Planning program, approximately 22 full time professional staff and three administrative staff. In addition, Jason Sartori now serves nearly full time as Associate Director. With some variation, and depending what is counted, we currently generate approximately \$2 million per year in grants and contracts and publish about ten articles per year in peer-refereed journals and, of course, produce numerous reports, working papers, and conference presentations.

Although we continue to address Smart Growth issues around the world, we also continue to engage extensively at the local level. As Center director, I am by statute a member of Maryland's Smart Growth Subcabinet and Sustainable Growth Commission. This has kept us engaged in state policy discussions on *PlanMaryland*, the state development plan, the regulation of septic systems, and transportation finance. We also work closely with Montgomery County's Planning Department on a variety of topics and recently joined the leadership team of the Baltimore Regional Sustainable Communities Planning effort. Our relationships with the Maryland Association of Counties, the Maryland Municipal League and the Chesapeake Bay program have also strengthened over the years.

We have established five subunits:

The Environmental Finance Center (EFC), one of nine EFCs funded by EPA and headed by Joanne Throwe, continues to help local governments find innovative ways to finance environmental preservation. One of its current focus areas is the Sustainable Maryland Certified Program for Maryland Municipalities. Administered cooperatively with the Maryland Municipal League, the program certifies communities for meeting stringent sustainability criteria.

The Transportation Policy Research Group, headed by Fred Ducca and cosponsored by the Maryland Department of Transportation, has built and maintains the Maryland State Transportation Model with loosely coupled econometric, land use, nutrient loading, and fiscal impact models.

The Center for the Use of Sustainable Practices, led by Amy Gardner, is the administrative home of WaterShed, the 2011 winner of the international solar de-cathlon sponsored by the US Department of Energy.

The Housing Strategies Group, headed by Casey Dawkins, leads our efforts in housing research and education, including the topics of housing affordability, matching housing with employment opportunities, and expanding housing choices.

Our newest subunit, the Planning and Design Center, is headed by Uri Avin, a seasoned planning practitioner in both the public and private sectors. The mission of the Planning and Design Center is to assist local, regional and state agencies in Maryland and across the nation on a wide range of projects, including land use planning, urban design, integrated land use/transportation planning, economic analysis, agricultural preservation, housing and environmental issues.

Our new logo, featured in this report, is designed to highlight the independent capacities of each of the subunits as well as the synergies created through the integration of multiple centers of expertise.

Over the course of the last decade, sustainable development or sustainable communities has begun to replace Smart Growth as the popular term to describe better and more thoughtfully considered approaches to urban and regional development. Part of this change is semantics and part is substantive. We don't plan to change our name, though our work will evolve along with the policy discussions we hope to inform. At this writing our website contains some 80 papers on a wide variety of topics. While some of these papers are now somewhat dated, we continue to believe that they can provide useful background information and historical context.

Again, thank you for taking time to review our report. All of us at the Center welcome your feedback and hope you will contact us if you need more information. Without such dialog between the Center and its external constituencies we cannot succeed at facilitating a smarter and more sustainable approach to urban and regional growth.

Gerrit Knaap
Executive Director

National Center for Smart Growth Research and Education

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 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 of Maryland to build on the national and 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.

From the outset, the NCSG 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 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. NCSG brings 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 inter-disciplinary research, public outreach and education. This approach recognizes that

The National Center for Smart Growth has continued to impact communities across the nation on issues related to the environment, transportation, public health, land-use, housing and community development by implementing an array of projects and programs that utilize an objective and multidisciplinary approach.

work on these interwoven issues directly affects the nature of communities, the landscape and environment and ultimately, the state’s quality of life.

NCSG’s 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.*
- 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.*



New Branding for NCSG

In 2011, the NCSG and its affiliate centers began implementing a new branding scheme. Developed by Shaw Jelveh Design in Baltimore, the new logos for the centers are modern and simple, featuring a continuous line illustration. Individually, the standard logos for the 6 affiliate centers and groups capture the unique character and scope of each organization. The logos can be combined, however, to demonstrate the operational relationships between the centers and the interrelatedness of their missions. In 2012, NCSG furthered its branding scheme with the development and release of its new website: <http://www.smartgrowth.umd.edu/>. The website provides the most up-to-date information on current research, programs and projects being conducted at NCSG and all of its affiliate centers, acting as a "one stop shop" for all things Smart Growth.



Although The National Center for Smart Growth (NCSG) provides administrative support for each of its subunits, it also leads in several research and service projects.

Montgomery County Zoning Rewrite

In 2011, the NCSG established a partnership with the Maryland National Park and Planning Commission (MNPPC) that focuses on Montgomery County's zoning ordinance.

For many years, Montgomery County has had one of the most complex zoning ordinances in the nation, with over 100 different land use designations. Under the leadership of former Planning Director, Rollin Stanley, the Montgomery County Planning Department began a multi-year effort to revamp the county's zoning ordinance. Since the beginning, the NCSG has helped the county perform this task.

Five center staff members, Jonathan Weiss, Matt Johnson, Emily Tittlebaum, Ray Hayhurst, and Jennifer Wise work regularly with Montgomery County staff on all elements of the zoning code rewriting effort. At the end of this four-year project, NCSG staff will have helped Montgomery County develop and adopt a modern zoning ordinance that will facilitate the transition of Montgomery County from a suburban to a more urban environment.

Maryland Scenario Project

The Maryland Scenario Project is a collaborative effort among multiple foundations, the Maryland State Highway Administration and the Maryland Department of Transportation that explores the ramifications of alternative development patterns for the State of Maryland.

Among the projects explored as part of the project include the following:

- What would happen if further BRAC decisions continued to distribute jobs to the far corners of the state?
- What would be the impact of a second bridge that connects Maryland's Eastern and Western Shores?
- What would happen to development patterns and travel behavior if energy prices continue to rise? and
- How would congestion be affected if bus rapid transit were to connect the Baltimore and Washington metropolitan areas?

The project began with four large public participation exercises called, Reality Check Plus. These provided valuable input on public preferences for smarter growth. Subsequently the NCSG developed a set of analytical and indicator models to build and explore alternative development scenarios for the state. These models include econometric, transportation, land use, and environmental impact models. Specific scenarios include Business as Usual, High Energy Price, Compact Growth, and Market Driven Change land use scenarios; and Truck Diversion, Transit Rich, Highway Tolls, and High Energy Cost transportation scenarios. Indicator measures of performance include fiscal impacts, nutrient loading, air emissions, vehicle miles and various measures of urban form.

Maryland Smart Growth Indicators Project

In January 2011, the National Center for Smart Growth finalized its effort to monitor the progress of the state's Smart Growth Program with the release of a report titled, *Indicators of Smart Growth in Maryland*. The project was the most comprehensive assessment of Maryland's Smart Growth Program to date and involved the collection of over 100 indicators of growth in categories of population, employment, transportation, environment, land-use and housing.

The report and its findings attracted the attention of area media, resulting in articles published in the *Baltimore Sun*, the *Gazette* and on WTOP.com. The report indicated that Maryland only tracked national trends in Smart Growth performance measures such as multi-family housing construction, per capita vehicle miles traveled, housing affordability and compact development; suggesting that Maryland has gained little measurable ground over the last decade toward creating more sustainable and equitable communities.

The SEED Initiative

The SEED Initiative is a collaborative project between the National Center for Smart Growth and several area partners, to develop, promote and implement an equitable and sustainable economic development approach in the state's first development plan, PlanMaryland. Funded primarily by the Surdna Foundation, the project attempts to integrate economic development with a larger sustainability agenda while promoting a more equitable distribution of income and investments in human and natural capital.

The NCSG's primary role is data analysis and it is currently reviewing economic, social and environment trends at the state, regional and employment center levels. Using the statewide transportation model, the NCSG will develop opportunity maps identifying areas of high and low opportunity based on variables such as: the accessibility of sustainable employment, high performing schools, safe environment, quality health care and adequate transportation.

The STAR Project

Collaborating with local interests, the NCSG's STAR Project is an effort to incorporate economic development priorities into the state's development plan, PlanMaryland. The STAR Project is funded by the Appalachian Regional Commission and is focused on the specific needs and opportunities available within the Western Maryland region.

The National Center for Smart Growth has developed a report titled, "An Inventory of Existing Economic Development Priorities in Western Maryland," which outlines the goals identified in the region's existing economic development and comprehensive plans. This initial task served to provide a perspective on the unique issues facing Western Maryland.

The NCSG then produced four briefs that present applicable data trends in Western Maryland in the following categories:

- Population and Demographics;
- Income and Employment;
- Transportation and Infrastructure; and,
- Land Use and Natural Resources.

The plan inventory and the four briefs then formed the basis for public workshops that were conducted in Garrett, Allegany and Washington Counties. The purpose of the workshops was to present the data collected by the NCSG and gather more information on the economic development priorities of the region.

A final STAR product will summarize the priorities, goals and obstacles identified in the workshops, while making connections to the data presented in the four briefs. The study's findings will be presented to various state agencies and commissions, with the goal of ensuring the Western Maryland counties are fully represented in the state's development plan.

Makeover Montgomery: Innovative Strategies for Rethinking America's Suburbs

In April, The National Center for Smart Growth, The University of Maryland Urban Studies and Planning Program and the Montgomery County Planning Department brought together some of the brightest minds in the fields of planning and development to "Makeover Montgomery," a three day conference on suburban sustainability. For residents and industry professionals, the conference was a chance to explore fresh ideas and perspectives on some of the most perplexing challenges facing suburbs like Montgomery County.

The conference was broken down into 13 sessions covering a wide range of topics, including urban sprawl, traffic congestion and sustainable redevelopment. One of the hot topics of the conference was Montgomery County's current zoning code, which is in the midst of a long-overdue re-write.

Under the direction of Professor Gerrit Knaap a group of graduate students presented a build out analysis under the current and proposed zoning. The build out analysis was used to estimate how jobs and households would be distributed under the alternative zoning regulations. The preliminary results showed that the county would be able to accommodate more growth under the proposed new zoning, especially in places like White Flint, Clarksburg, and Germantown.

High School GIS Internship Program

The National Center for Smart Growth developed the High School GIS Internship Program in an attempt to provide students in low-income areas with the opportunity to gain knowledge and experience in an area that is typically reserved for those at the university level.

This year's program included three students, chosen out of a number of interested applicants from around Prince George's and Montgomery Counties. Students committed to at least six hours a week at the NCSG after school.

While the program provides the benefit of real work-force training to high school students, it is equally beneficial to the NCSG, providing support to research. Interns split their time at the Center between GIS training and actual mining and mapping for various current NCSG research projects.

Moving Maryland

The NCSG along with the Maryland Department of Transportation and the Maryland Department of the Environment, hosted an interactive Symposium on transportation, growth, and the economy at the University of Maryland, College Park Campus on November 20, 2009 .

The event fostered dialogue among invited participants on key policy questions relating to transportation mobility and access, economic vitality, and environmental performance. The Symposium informed the debate on these complex and increasingly intertwined policy arenas and considered how best to measure Maryland's progress toward achieving these multiple policy goals. In an effort to think through how Maryland can move forward most effectively, the session offered lessons learned from around the country and spurred dialogue among Maryland policymakers, transportation stakeholders, and other interested groups.



The Environmental Finance Center (EFC) is one of nine university-based centers across the country established by the U.S. Environmental Protection Agency in 1992. These centers help create innovative financing solutions that assist communities with managing the costs associated with environmental protection and improvement.

The EFC is in its fifth year since merging with the NCSG and continues to expand the NCSG's capacity beyond land-use research and education. Under the direction of Joanne Throwe, 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 Sustainable Maryland Certified Program

Sustainable Maryland Certified (SMC) is an initiative of the EFC designed to support Maryland's 157 municipalities as they look for cost-effective and strategic ways to protect their natural assets and revitalize their communities. This free and voluntary certification program helps communities choose a direction for their sustainability efforts, complete their chosen actions with help from program tools and be recognized for their accomplishments.

SMC opened to municipalities in June 2011 at the Maryland Municipal League Convention with the launch of its website, www.sustainablemaryland.com. The Town of Berlin, Maryland was the first municipality certified under the program in April 2012. The City of Rockville was the second certified community in June 2012. Currently three municipalities have submitted applications for certification in order to be recognized at the SMC Awards Program being held on October 4, 2012. In addition, there are 24 communities registered for potential future SMC certification.

In the coming year, SMC will focus on assisting registered communities through the certification process and engaging communities in parts of the state not well represented in the program. In future years the SMC will incorporate additional actions and levels of certification in order to keep municipalities pushing their sustainability efforts forward.

Air Quality Program

The Mid-Atlantic Region faces some of the most severe air quality problems in the nation. Ground transportation of goods is a significant source of emissions that causes smog and other harmful air pollutants.

To combat the harmful effects, the EFC developed an air quality program funded by the American Recovery and Reinvestment Act to reduce emissions at the Port of Baltimore. The program was designed to retrofit, repower or replace vehicles at the port. In all, \$2.76 million was invested in 86 vehicles for a total estimated reduction of 781 tons of NOx and 38.5 tons of particulate matter.

The success at the Port of Baltimore quickly led to the expansion of the EFC's air quality programming. Funded by an EPA SmartWay grant, the EFC continues to work with partners at the Mid-Atlantic Regional Air Management Association to implement the Mid-Atlantic Dray Truck Replacement Program. The program requires older, dirtier trucks to be scrapped and provides applicants up to \$20,000 towards the purchase of more emission-efficient vehicles.

The dray truck replacement program launched at the Port of Virginia in 2011 replacing 23 trucks in its first year. The program opened at the Port of Baltimore in early 2012 with funds in place to replace up to 50 trucks. It is expected that a combined program will open at the ports of Philadelphia and Wilmington in late 2012.

Stormwater Financing and Outreach Unit

Effectively managing stormwater is one of the greatest challenges faced by communities throughout the Mid-Atlantic region. Like all infrastructure, stormwater management programs are expensive to implement and maintain. In response to the dilemma, the Stormwater Financing and Outreach Unit was created to address stormwater financing questions and help craft strategies that best meet local needs.

The Stormwater Unit often provides several services to assist communities including: an assessment of existing stormwater management activities, research and analysis on financing options, consultation with municipal or county staff and assistance with outreach and education activities.

Past and current projects include economic impact analysis and recommendations for Baltimore City, MD; Anne Arundel County, MD; and Lynchburg, VA. Stormwater feasibility studies and financing strategy development recommendations have been conducted for Ocean City, MD; Berlin, MD and Salisbury, MD. Similar efforts with the City of Bowie and the Town of Federalsburg in Maryland will be underway soon.



The Transportation Policy Research Group (TPRG) is a joint effort between the University of Maryland and the Maryland Department of Transportation. Established in 2009, the mission of 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. Under the guidance of Dr. Frederick Ducca, TPRG has continued to apply research and implement programs to provide a better understanding of the ways that land-use and transportation affect each other.

Mega Regions

For the Federal Highway Administration, the Transportation Policy Research Group is completing the development of an economic and transportation model for the Chesapeake Bay Mega-region. The model covers the area from Wilmington, Delaware to Norfolk, Virginia. TPRG has used the model to analyze the impacts of high-energy prices on the mega-region transportation system, land-use patterns and economic flows within the mega-region.

Time Dependent Networks

The Transportation Policy Research Group has recently begun a project to develop methods to improve the analysis of network performance within the Maryland Statewide Transportation Model. The project will develop methods to represent time on a continuous basis, enabling a more detailed estimation of travel time and network performance. This is the first attempt at applying these methods on a statewide basis. The Maryland State Highway Administration, the Federal Highway Administration and the University of Maryland jointly fund this project.

Maryland Statewide Transportation Model

The Transportation Policy Research Group recently completed the third year of developing and improving the Maryland Statewide Transportation Model (MSTM) for the Maryland State Highway Administration.

The MSTM is an analytic tool designed to address issues beyond the coverage and capabilities of the two primary Metropolitan Planning Organization (MPO) models in the State of Maryland. These issues include traffic in rural areas outside the coverage of MPO models and statewide transit planning.

During 2012, TPRG provided ongoing support to the State Highway Administration on applications of the model and began to examine technical improvements such as sub-area analysis tools and improved estimates of the impacts of travel time on travel behavior.



The Center for the Use of Sustainable Practices (CUSP) was founded in 2008 at University of Maryland's School of Architecture, Planning & Preservation as an inter-disciplinary center for the design and research of sustainable practices. Under the direction of Amy Gardner, the center conducts research and engages in design, education and public outreach activities. CUSP focuses on sustainable practices at multiple scales: the building, the community and the city.

U.S Department of Energy Solar Decathlon 2011

Every two years, the U.S. Department of Energy challenges 20 collegiate teams to design, build, and operate solar-powered houses that are affordable, energy-efficient and attractive. The winner of the competition is the team that best blends cost-effectiveness, consumer appeal and design excellence with optimal energy production and maximum efficiency.

In 2011, the University of Maryland participated in its 4th Solar Decathlon, with CUSP serving as the administrative home of the University's competition entry. The mission was to design a solar-powered house, inspired and guided by the Chesapeake Bay ecosystem. Team Maryland's entry, *WaterShed*, proposed solutions to both water and energy shortages by connecting the house and landscape.

Garnering the highest percentage of points awarded in the history of the competition, *WaterShed* won the Solar Decathlon. It placed in the top four in all but one of the ten contests and in the top three in eight of the ten contests. *WaterShed* placed first in Architecture, Energy Balance, and Hot Water; second in Market Appeal and Appliances; and Third in Communications, Comfort Zone, and Home Entertainment.

Recognizing the richness of the overall vision, Pepco purchased *WaterShed* and plans to relocate the home to one of its facilities in Montgomery County, Maryland. Under the arrangement, Pepco and the University will partner on its operation, monitor its performance, conduct ongoing research and work closely on designing educational materials.

Pepco and the University of Maryland are also exploring the potential of creating a regional STEM Energy education program for veterans and university, community college, high school and middle school students throughout Pepco's service area that would utilize *WaterShed* as an integral part of the curriculum.



Housing Strategies Group (HSG) was established in 2010 to conduct housing policy research, while making connections to Smart Growth and sustainability. HSG is engaged in research, teaching and public education with respect to issues such as housing affordability, matching workforce housing with employment opportunities and expanding housing choice to meet changing lifestyles.

How Do HUD-Assisted Households Balance Housing, Neighborhoods, and Transportation?

Funded by the U.S. Department of Housing and Urban Development this project relies on data from the Moving to Opportunity Experiment and the Welfare to Work Voucher Program to examine how households make tradeoffs among housing characteristics, neighborhood amenities and transportation access when receiving HUD housing assistance subsidies.

Public Housing Reform and Desegregation: The Case of Chicago's Plan for Transformation

Funded by the U.S. Department of Housing and Urban Development, the Public Housing Reform and Segregation project relies on administrative data describing the location of HUD-assisted households in Chicago to identify patterns of racial and economic segregation before and after the implementation of Chicago's most ambitious public housing reform program.

Barriers to Development in Priority Funding Areas

Enacted in 1997, Maryland's Smart Growth Program established Priority Funding Areas (PFAs) to encourage sustainable development patterns. Utilizing this tool, the state attempts to promote development and revitalization within Maryland's urbanized areas, while limiting the urbanization of Maryland's rural areas. The program, however, is not without limitations. One assertion often heard from planners and developers alike is that state and local regulations hinder or prohibit growth from occurring inside PFAs, as a result, developers are forced to build at lower densities inside these areas while other development is deflected to areas outside PFAs, which not only defies the purpose of the Smart Growth Program but can also result in increased construction costs, as the projects do not qualify for infrastructure funding.

In January 2012, the Housing Strategies Group released a report on how critical stakeholders view the efficacy of Priority Funding Areas and the barriers to development inside Priority Funding Areas. The study found that most respondents think PFAs are only somewhat effective or not effective at all, and that most think it's more difficult to develop land inside than outside PFAs. For this study, 47 stakeholders of growth in Maryland were interviewed, including: representatives from county and municipal planning departments, planning consultants, land-use attorneys, organizers from local community-based groups, staffers at prominent statewide nonprofit advocacy organizations and developers.



The Planning and Design Center (PDC), is the newest addition to the National Center for Smart Growth at the University of Maryland. Lead by director Uri Avin, the PDC assists local, regional and state agencies in Maryland and across the nation on a wide range of projects. These include land use planning, urban design, integrated land use/transportation planning, economic analysis, agricultural preservation, housing and environmental issues. A particular strength of the PDC is its extensive modeling and visualization capabilities.

The PDC draws on the substantial expertise of the faculty and practitioners associated with the NCSG and the University and applies their expertise to planning for sustainability. Drawing on the national experience of its staff in award-winning work around the country, the PDC assists with comprehensive plans, Smart Growth audits, corridor planning, MPO scenario-based planning, and multi-modal planning.

Sustain Southern Maine

In 2012, the Planning and Design Center began to assist the Metropolitan Planning Organization and their regional partners in an effort to effect improvements in housing affordability, transportation and energy cost throughout the state of Maine, utilizing the HUD Sustainable Communities Grant.

Because of Maine's small town governance tradition, change towards regional collaboration can only be effected if localities clearly see its benefits. The approach here, therefore, is to utilize regional modeling and planning work to support three detailed and focused project planning efforts in different towns that demonstrate local as well as regional benefits.

Rezoning for Route 28, Loudoun County, VA

The Planning and Design Center advised Loudoun County on how to rezone Route 28, a prime corridor adjacent to Dulles Airport. The objective was to capture Office and Mixed Use land uses and relinquish its retail-oriented zoning. The current zoning had been in place for decades and was built into a local tax district, a matter that legally complicated the effort. The recently adopted Master Plan for the corridor, which served as the basis for the rezoning effort, designated large stretches for office and three nodes for mixed use. Implementing and phasing this plan in this context is the major challenge of this ongoing effort.

Central York County Connector Study

The Planning and Design Center participated in a multi-corridor study designed to improve access to central York County, Maine. The study aimed to evaluate the effects of improved access on enhanced economic competitiveness. The study developed several ambitious highway alternatives including associated land use strategies to preserve capacity.

Like many communities who hope that improved road access can reverse a stagnant economic base, the town of Sanford, at the core of York County, asked the MaineDOT to assess prospects for major improvements to access I-95, 10 miles to the south. The team developed a detailed travel demand model and deployed PRISM - a tool that relates change in accessibility to economic impacts and cost-benefit outcomes.

Changes in regional accessibility were found to be too small to cause significant changes in economic activity; the cost-benefit ratios of the ambitious corridor improvements were very low. Consequently, much more modest transportation improvements were designed on several of the corridors feeding central York. Given the low rural densities involved, shifts in land use had little effect; improving local access management, however, was an important recommendation to preserve the capacity and safety of the corridors along their length and at particular intersections.

Publications from the National Center for Smart Growth
Research and Education

Books

Brooks, N., K. Donaghy, and G. Knaap (Eds.) (2011). *Oxford University Press Handbook on Planning and Economics*. Oxford, UK: Oxford University Press.

Book Chapters

Dawkins, C. (2011). Race, Space, and the Dynamics of Self-Employment. In A. Southern (Ed.), *Enterprise, Deprivation and Social Exclusion: The Role of Small Business in Addressing Social and Economic Inequalities* (74-98). New York, NY: Routledge.

Ding, C. (2011). Land Use Reform, Land Markets, and Urban Land Use in Beijing. In D. Lu (Ed.), *The Great Urbanization of China*. New York, NY: World Scientific.

Ding, C., and X. Zhao (2011). Urbanization and Policy in Japan, South Korea and China. In N. Brooks, K. Donaghy, and G. Knaap (Eds.), *Handbook of Urban Economics and Planning*. New York, NY: Oxford University Press.

Juntunen, L., G. Knaap, and T. Moore (2011). Fiscal Impact Analysis and the Costs of Alternative Development Patterns. In N. Brooks, K. Donaghy, and G. Knaap (Eds.), *Oxford University Press Handbook on Planning and Economics*. Oxford, UL: Oxford University Press.

Kaza, N., and G. Knaap (2011). Principles of Planning for Economists. In N. Brooks, K. Donaghy, and G. Knaap (Eds.), *Oxford University Press Handbook on Planning and Economics*. Oxford, UL: Oxford University Press.

Knaap, G. and R. Lewis (2011). Metropolitan Planning for Sustainability and the Hegemony of Transportation. In E. Seltzer and A. Carbonell (Eds.), *American Regional Planning: Practice and Prospect*. Cambridge, MA: Lincoln Institute of Land Policy.

Varner, C., R. Bennett, M. Simon, A. Gardner, and G. Knaap (2011). LEED in the District of Columbia. In M. Slavin (Ed.), *Sustainability in America's Cities: Creating the Green Metropolis*. Washington, DC: Island Press.

Refereed Articles in Archival Journals

Chakraborty, A., N. Kaza, G. Knaap, and B. Deal (2011).

Robust and Contingent Plans: Scenario Planning for an Uncertain World. *Journal of the American Planning Association*, 77(3): 251-266.

Chakraborty, A., and S. Mishra (2013). Land Use and Transit Ridership Connections: Implications for State-level Planning Agencies. *Land Use Policy*, Elsevier Publications, 30(1): 458-469.

Chakraborty, A., S. Mishra, and Y. Kim (2012). Extending the application of urban models in plan making. *Journal of the Urban and Regional Information Systems Association*, 24(1): 53-62.

Ding, C. (2010). The Impact of Urban Spatial Structure and Land Use Pattern on Urban Transportation. *Urban Transport of China*, 8(5): 28-35.

Ding, C., and E. Lichtenberg (2011). Land and Urban Economic Growth in China. *Journal of Regional Science*, 51(2): 299-317.

Ding, C., A. Qiu, and J. Wang (2011). Migrant Housing during Rapid Urbanization in China: Typology and Assessment. *Urban Studies*, 117(6): 49-54 (Chinese).

Ding, C., and X. Xie (2010). International Comparison of CBD Development. *Urban Studies*, 17(10): 72-82 (Chinese).

Ding, C. and X. Zhao (2011). Assessing Urban Spatial Growth Patterns in China during Rapid Urbanization. *The Chinese Economy*, 44(1): 46-71.

Kaza, N., G. Knaap, I. Knaap, and R. Lewis (2011). Peak Oil, Urban Form, and Public Health: Exploring the Connections. *American Journal of Public Health*, 101(9): 1598-606

Khasnabis, S., S. Dhingra, S. Mishra, and C. Safi (2010). Mechanisms for Transportation Infrastructure Investment in Developing Countries. *Journal of Urban Planning and Development*, American Society of Civil Engineers (ASCE), 136(1): 94-103.

Khasnabis, S., S. Mishra, and C. Safi (2012). An Evaluation Procedure for Mutually Exclusive Highway Safety Alternatives under Different Program Missions. *Journal of Transportation Engineering*, American Society of

Civil Engineers (ASCE), (In Press, DOI: doi:10.1061/(ASCE)TE.1943-5436.0000397).

Mathew, T., S. Khasnabis, and S. Mishra (2010). Optimal Resource Allocation among Transit Agencies for Fleet Management. *Transportation Research Part A: Policy and Practice*, 44(6): 418-432.

Mishra, S., and S. Khasnabis (2012). An Optimization Model for Allocating Resources for Highway Safety Improvement at Urban Intersections. *Journal of Transportation Engineering*, American Society of Civil Engineers (ASCE), 138(5): 535-547.

Mishra, S., S. Khasnabis, and S. Dhingra (2012). A Simulation Approach for Modeling Risk in Transportation Infrastructure Investment Decision Making. *Journal of Research in Transportation Economics*, Elsevier Publications, (In Press, DOI: 10.1016/j.retrec.2012.05.009).

Mishra, S., T. Mathew, and S. Khasnabis (2010). Single Stage Integer Programming Model for Long Term Transit Fleet Resource Allocation. *Journal of Transportation Engineering*, American Society of Civil Engineers (ASCE), 136(4): 281-290.

Mishra, S., T. Welch, and M. Jha (2012). Performance Indicators for Public Transit Connectivity in Multi-Modal Transportation Networks. *Transportation Research Part-A: Policy and Practice*, 46(7): 1066-1085.

Mishra, S., X. Ye, F. Ducca, and G. Knaap (2011). A Functional Integrated Land Use-Transportation Model for Analyzing Transportation Impacts in the Maryland-Washington D.C. Region. *Journal of Sustainability Science Policy and Practice*, 7(2): 1-10.

Rivasplata, C., H. Iseki, and A. Smith (2012). Transit Coordination in the U.S.A: A Survey of Current Practice. *Journal of Public Transportation*, 15(1): 53-73.

Yoh, A., M. Smart, H. Iseki, and B. Taylor (2011). Hate to wait: The effects of wait time on public transit travelers' perceptions. *Journal of the Transportation Research Board*, 2216: 116-124.

Conference Presentations (Proceedings)

Chakraborty, A., and S. Mishra (2011). *Land Use and Transit Ridership Connections: Implications for State-level Planning Agencies* (Paper # 12-3895). Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Dawkins, C. (2011). *Exploring the Spatial Distribution of Low Income Housing Tax Credits*. Association of Collegiate Schools of Planning Annual Conference, Salt Lake City, UT, 2011.

Ding, C. (2011). *Megacities and Urban Infrastructure in China. Workshop on Discovering China: A Scenarios Prospective*, Sao Paulo, Brazil, February 21-23, 2011.

Ding, C. (2011). *Property Taxation in China: Current Reform and Future Prospects*. International Property Tax Institute Annual Meeting, Dublin, Ireland, May 10-11, 2011.

Ding, C. (2011). *Transportation, Regional Concentration and Economic Growth*. 58th Annual North American Meetings of the Regional Science Association International, Miami, FL, November 10-12, 2011.

Ding, C., and Y. Niu (2011). *Spending Behaviors of Off-Budget Revenue of Chinese Cities*. 41st Conference of Urban Affairs Association: Reclaiming the City: Building a Just and Sustainable Future, New Orleans, LA, March 16-19, 2011.

Ding, C., and Y. Niu (2011). *Spending Patterns of Off-Budget Revenue: Evidence from Chinese Prefectures*. 58th Annual North American Meetings of the Regional Science Association International, Miami, FL, November 10-12, 2011.

Ding, C., Y. Niu, and G. Knaap (2011). *Industrial Clusters and Agglomeration Economics in Maryland*. 58th Annual North American Meetings of the Regional Science Association International, Miami, FL, November 10-12, 2011.

Ducca, F., R. Moeckel, S. Mishra, and T. Weidner (2011). *A mega-region approach to planning for a High Energy*

Price Future (Paper # 12-3556). Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Iseki, H. (2011). *A New Stage of the U.S. Transit Service Privatization? A Delegated Management Contract in the Greater New Orleans Region*. 52nd Annual Conference of the Association of Collegiate Schools of Planning, Salt Lake City, UT, October 13-16, 2011.

Iseki, H. and R. Houtman (2011). *Examination of Recent Developments in DBFO Public Private Partnership Transportation Projects in North America*. Annual Meeting of the Transportation Research Board (TRB) 90th annual meeting, Washington, D.C., January, 2011.

Iseki, H., and R. Houtman (with C. Rivasplata) (2011). *Transit Service Privatization as a Provision Strategy: A Case Study in the Greater New Orleans Region*. 41st Conference of Urban Affairs Association: Reclaiming the City: Building a Just and Sustainable Future, New Orleans, LA, March 16-19, 2011.

Iseki, H. and M. Smart (2012). *How Do People Perceive Service Attributes at Transit Facilities? An Examination of Perceptions of Transit Service by Transit User Demographics and Trip Characteristics*. Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Iseki, H., M. Smart, B. Taylor, A. Yoh, and N. Wong (2012). *Tool for Assessing Station Characteristics (TASC): Identifying Service Quality Improvements at Transit Stops and Stations*. Poster. APA's 2012 National Planning Conference, Los Angeles, CA, April 14-17, 2012.

Jha, M., and S. Mishra (2012). *Maximal Bandwidth Problems with Variable Demand and Multi-Commodity Flow Characteristics*. *Innovations in Traffic Flow Theory, Highway Capacity, and Quality of Service Symposium*, Transportation Research Board (TRB), Florida, 2012.

Jha, M., S. Mishra, and Y. Weldegiorgis (2011). *A Trade-off Analysis of Safety and Congestion Impacts of Driver Behavioral Changes at Red Light Camera Equipped Intersections*. 3rd Conference on Road Safety Simulation, Indianapolis, IN, 2011.

Khasnabis, S., S. Mishra, and S. Safi (2010). *Identification of Hazardous Locations: An Alternative Approach*. Compendium of Papers in Conference on Infrastructure, Sustainable Transportation and Urban Planning, Indian Institute of Science, Bangalore, India, 2010.

Mishra, S., A. Chakraborty, and G. Knaap (2011). *Mega-regional scenarios and how they can assist decision-making*. Association of Collegiate Schools of Planning (ACSP), October, 2011.

Mishra, S., F. Ducca, S. Mahaparta, and X. Ye (2011). *Socio-economic Data Reconciliation Procedure in Maryland Statewide Transportation Model: Challenges, Current Solutions, and Future Steps*. TRB 2011 Using Census Data for Transportation Applications Conference, Irvine, CA, October, 2011.

Mishra, S., H. Iseki, and R. Moeckel (2011). *Multilevel Demand Modeling Techniques for Analyzing Freight Movement in Stochastic Networks and Uncertain Market Conditions*. 4th METRANS Urban Freight Conference, California, October, 2011.

Mishra, S., M. Jha, and T. Welch (2011). *An Analytical Modeling Framework to Determine Optimal Connectivity of a Multimodal Transit Network*. Conference of Transportation Research Group of India (CTRG), Bangalore, India, December, 2011.

Mishra, S., S. Khasnabis, and S. Swain (2011). *An Approach to Incorporate Uncertainty and Risk in Transportation Infrastructure Investment Decision Making: Detroit River International Crossing*. Compendium of Papers in 90th Annual Board Meeting of Transportation Research Board, National Research Council, Washington D.C., 2011.

Mishra, S., and S. Sharma (2011). *Developing dynamic parameters of volume-delay function for transportation planning applications*. Transportation Research Board, Planning Application Conference, Reno, Nevada, May, 2011.

Mishra, S., and S. Sharma (2011). *Optimal Emission Pricing Models for Containing Carbon Footprints Due to Vehicular Pollution in a City Network*. Compendium of Papers in 90th Annual Board Meeting of Transpor-

tation Research Board, National Research Council, Washington D.C., 2011.

Mishra, S., Y. Wang, and T. Welch (2012). *A continuum traffic flow model to analyze complex network and mixed traffic conditions*. Innovations in Traffic Flow Theory, Highway Capacity, and Quality of Service Symposium, Transportation Research Board (TRB), Florida, 2012.

Mishra, S., and T. Welch (2012). *A Joint Travel Demand And Environmental Model To Incorporate Emission Pricing For Large Transportation Networks*. Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Mishra, S., X. Ye, F. Ducca, and G. Knaap (2010). *A Functional Integrated Land Use-Transportation Model for Analyzing Transportation Impacts in the Maryland-Washington D.C. Region*. Association of Collegiate Schools of Planning (ACSP), 2010.

Moeckel, R., and S. Mishra (2011). *Tri-level freight modeling: A simulation of trucks going near and far*. Transportation Research Board Planning Application Conference, Reno, Nevada, May, 2011.

Rivasplata, C., H. Iseki, and A. Smith (2011). *Transit Coordination in the U.S.A: A Survey of Current Practice*. Annual Meeting of the Transportation Research Board (TRB) 90th annual meeting, Washington, D.C., January, 2011.

Samanta, S., S. Mishra, and M. Jha (2011). *Freight Railcar Routing Problems with a Time Window: Case Study of Recent Surge in Coal Export through the Port of Baltimore*. 4th METTRANS Urban Freight Conference, California, October, 2011.

Welch, T. (2011). *The Value of Access: A Longitudinal Study of Transit Proximity Capitalization in Atlanta*. Association of Collegiate Schools of Planning conference, Salt Lake City, UT, October, 2011.

Welch, T. (2012). *Trends in Mega-Regional Spatial Distribution and Its Implications For Transport And Infra-*

structure Planning. Association of European Schools of Planning conference, Ankara, Turkey, July 2012.

Welch, T., and S. Mishra (2011). *Incorporating an Interdependent Travel Demand and Environmental Model for Emission Pricing in Large-Scale Networks* (Paper # P12-5506). Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Welch, T., and S. Mishra (2012). *Travel Demand Mechanisms for Emission Reduction Strategies: A Case Study of Montgomery County, Maryland*. Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Welch, T., S. Mishra, and M. Jha (2012). *Transit Service Indicators for Alternative Route Structure Analysis*. Proceedings of the 2012 WSEAS International Conference on Computer Engineering and Applications (CEA 12), Harvard University, Boston, MA, January, 2012.

Weldegiorgis, Y., S. Mishra, and M. Jha (2011). *Comparing Driver and Capacity Characteristics at Intersections with and without Red Light Cameras* (Paper # 12-4430). Annual Meeting of the Transportation Research Board (TRB) 91st annual meeting, Washington, D.C., January, 2012.

Yoh, A., M. Smart, H. Iseki, and B. Taylor (2011). *Hate to wait: The effects of wait time on public transit travelers' perceptions*. Annual Meeting of the Transportation Research Board (TRB) 90th annual meeting, Washington, D.C., January, 2011.

Monographs, Reports, Working Papers, and Other Publications

Dawkins, C. (2011). *Exploring the Spatial Distribution of Low Income Housing Tax Credit Properties*. U.S. Department of Housing and Urban Development, Washington, DC, 2011.

Dawkins, C. (2011). *Measuring Potential Discrimination in HUD Assisted Housing Programs: Indiana and Illinois Case Studies*. U.S. Department of Housing and Urban Development, Washington, DC, 2011.

Dawkins, C. (2011). *Public Housing Reform and Desegregation: The Case of Chicago's Plan for Transformation*. Virginia Tech, Alexandria, VA, 2011.

Dawkins, C. (2011). *Understanding Recent Intermountain West Housing Market Dynamics*. Brookings Mountain West, University of Nevada at Las Vegas, Las Vegas, NV.

Dawkins, C., T. Koebel, M. Cavell, S. Hullibarger, and D. Hattis (2011). *Regulatory Barriers to Manufactured Housing Placement in Urban Communities*. U.S. Department of Housing and Urban Development, Washington, DC.

Iseki, H., C. Rivasplata, R. Houtman, A. Smith, C. Seifert, and T. Sudar (2011). *Examination of Regional Transit Service under Contracting: A Case Study of Greater New Orleans Region*. Mineta Transportation Institute, San Jose State University and Gulf, and Gulf Coast Research Center for Evacuation and Transportation Resiliency, Merritt C. Becker, Jr. University of New Orleans Transportation Institute. Report No: CA-MTI-11-2904. 74 pages. (Peer reviewed).

Kawano, Y., and H. Iseki (2011). *GIS Volunteering: Tohoku Kanto Earthquake in Japan: Earthquake/Tsunami relief mission with Crisis Commons – Japan. Report*. The Urban and Regional Information Systems Association (URISA), GISCorps. Available at: http://www.giscorps.org/index.php?option=com_content&task=view&id=102&Itemid=63.

Knaap, G., lead Author, (2011). *Population Growth and Infrastructure, in Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change Phase II: Building societal, economic, and ecological resilience*. Report of the Maryland Commission on Climate Change Adaptation and Response and Scientific and Technical Working Groups. Annapolis, MD: Maryland Department of Natural Resources.

Kugler, D. and A. Santacruce (2012). *Summary of Manure-to-Energy Initiative Interviews with Project Farmers – May 2012*. The Environmental Finance Center, College Park, MD, 2012.

Kugler, D. and A. Santacruce (2012). *Manure to Energy Initiative: Financial Template for Delaware, Maryland, Pennsylvania, Virginia, and West Virginia – May 2012*. The Environmental Finance Center, College Park, MD, 2012.

Hughes, M. and J. Cotting (2012). *Stormwater FAQ – April 2012*. The Environmental Finance Center, College Park, MD, 2012.

Hughes, M., J. Cotting and D. Nees (2012). *Uncapping the Pros and Cons of a Bottle Deposit Program – March 2012*. The Abell Report, 25(2): 1-12.

Nees, D. (2012). *Analysis of the Chesapeake and Atlantic Coastal Bays Trust Fund – January 2012*. Report to the Maryland Department of Natural Resources. The Environmental Finance Center, College Park, MD, 2012.

Throwe, J., J. Cotting, M. Hughes, and D. Nees (2011). *2011 Impact Analysis of a Beverage Container Deposit Program in Maryland – December 2011*. The Environmental Finance Center, College Park, MD, 2011.

Throwe, J. and M. Hughes (2011). *Financing Feasibility Study for Stormwater Management in Ocean City, Maryland – September 2011*. The Environmental Finance Center, College Park, MD, 2011.

Fried, L (2011). *Clean Car Clinic Final Report 2010-2011 – July 2011*. The Environmental Finance Center, College Park, MD, 2011.

Cotting, J. (2010). *Improving Capacity: Options for Virginia's Capital Region Land Conservancy: Final Report October 2010*. The Environmental Finance Center, College Park, MD, 2010.

Cotting, J. (2010). *Improving Organizational and Conservation Capacity: Options for Maryland's Lower Shore Land Trust – June 2010*. The Environmental Finance Center, College Park, MD, 2010.

Throwe, J. and M. Hughes (2010). *Sassafras River Agriculture and Ecology Center: Concept Paper – February 1, 2010*. The Environmental Finance Center, College Park, MD, 2010.

Faculty and Senior Research Scientists

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 Subcabinet 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.

Frederick Ducca is *director of the Transportation Policy and Research Group* at the National Center for Smart Growth. Dr. Ducca has 29 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. 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.

Casey Dawkins is an associate professor of Urban Studies and Planning, research associate with the

National Center for Smart Growth at the University of Maryland and *director of the center's Housing Strategies Group*. Prior to joining the University of Maryland, Dr. Dawkins was an associate professor of Urban Affairs and Planning, director of the Metropolitan Institute, director of the Center for Housing Research, and editor of the journal *Housing Policy Debate* at Virginia Tech. He has written two books and over 20 refereed journal articles and book chapters on these topics. Dr. Dawkins was awarded an Urban Scholars Fellowship from the U.S. Department of Housing and Urban Development to examine the impact of racial segregation on racial disparities in the transition to first-time homeownership.

Chengri Ding is associate professor of Urban Studies and Planning and director of the Chinese Land Policy Program, cosponsored 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.

Hiroyuki Iseki is a faculty researcher with the National Center for Smart Growth and is assistant professor of Urban Studies and Planning. Iseki and his research team have recently completed a case study in New Orleans on transit service privatization and regional coordination titled "Examination of Regional Transit Service Under Contracting". He has also been involved in the series of research projects titled "Tool Development to Evaluate the Performance of Intermodal Connectivity" with researchers from the UCLA Institute of Transportation Studies over the last six years. Iseki's work has been published in a range of transportation and planning journals including *Transportation Research Part A: Policy and Practice*, *Transport Reviews*, *Journal of the Transportation Research Board*, *Journal of Public Transportation*, *Crime Prevention through Environmental Design Journal*, and *Journal of Planning Education and Research*.

Charles Towe is an assistant research professor at the

National Center for Smart Growth and also holds an assistant professorship in the Department of Agricultural and Resource Economics. His fields of interest include behavioral economics, housing policy, 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*. Charles is an environmental economist who earned his Ph.D. at the University of Maryland in Agricultural and Resource Economics. He also holds a degree in Economics from Tufts University and the University of North Carolina at Asheville.

Amy Gardner, Associate Professor and AIA LEED-AP has been on the faculty of the University of Maryland School of Architecture, Planning and Preservation since 1989, and is a registered architect in the District of Columbia and Maryland. As *director of CUSP*, Gardner's focus is on creating cross-generational and academic-industry partnerships, and developing design and research practices necessary for creating enduring, ecologically-advanced buildings and communities.

Gardner is the lead faculty adviser and principal investigator for the University of Maryland's WaterShed entry to the 2011 Department of Energy Solar Decathlon, and was the same for UM's successful 2007 Solar Decathlon entry, LEAFHouse. She was the founding coordinator of the UM Architecture Program's Comprehensive Studio and Advanced Technology.

Uri Avin is NCSG's Planning and Design Center director and a research professor at the University of Maryland. Prior to his appointment at UMD, Uri was the Practice Leader for Regional Growth Management at Parsons Brinckerhoff (PB). He was part of the PB PlaceMaking group that provided a full range of urban planning and design services. During the decade of the 1980s, he served as a planning director or deputy director in three Maryland counties – Howard, Baltimore and Harford - where his innovative Smart Growth plans earned him national recognition. He served on the Board of the Center for Watershed Protection and on the Maryland's Climate Change Commission, Greenhouse Gas and Carbon Mitigation

Work Group. He is also a member of the Transportation Research Board's Committee on Transportation and Land Development and of the Technical Committee of AMPO.

Uri holds graduate degrees in architecture, urban design and city planning from the University of Pennsylvania.

Senior Staff

Joanne M. Throwe is the director for the Environmental Finance Center located at the University of Maryland and has been there since 2005. Her work focuses on providing technical assistance on financing issues related to environmental protection activities which help communities better manage their limited resources. Ms. Throwe's particular areas of expertise are related to sustainable water infrastructure, agriculture, and transportation issues. During her more recent years at the University of Maryland, Ms. Throwe was selected to work simultaneously with the U.S. Department of Agriculture as part of a shared faculty agreement. She was able to lend her expertise in coordinating special agriculture projects related to renewable energy, ecosystem services, and water quality improvement projects on a national scale. 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 from the University of Maryland.

Jennifer Cotting is assistant director at the Environmental Finance Center. Ms. 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. In addition, Ms. Cotting serves as

the EFC's representative to the Green Infrastructure Community of Practice, the Source Water Collaborative, and the Smart Growth Network and is a green infrastructure financing instructor for the Conservation Fund's course Strategic Conservation Using a Green Infrastructure Approach and Virginia Tech's Executive Master of Natural Resources program. Prior to joining the EFC, Ms. Cotting worked as an independent consultant developing and implementing environmentally based education and outreach programs for non-profit 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.

Dan Kugler joined the Environmental Finance Center in November 2011 after a 36 year USDA career in the National Institute of Food and Agriculture and the Economic Research Service.

For USDA, Dr. Kugler provided leadership for many program areas, including natural resources and the environment, agricultural production and sustainability, social and human sciences, and youth and community development. For EFC, he will lead and build-out the Agricultural Finance Unit, guide participation in the Manure to Energy project, and seek broad collaboration with the land-grant universities of the Mid-Atlantic Region.

Dr. Kugler's university education was at Michigan State University where he earned a BS in physics, a MS in natural resource development, and a Ph.D. in agricultural economics

Dan Nees has recently rejoined the Environmental Finance Center as a senior research associate. Prior to returning to EFC, he led environmental market and water quality programs at Forest Trends, a global NGO that seeks to develop market and economic solutions to global environmental problems. Prior to joining Forest Trends, Dan led water quality programs at the World Resources Institute, an environmental think-tank located in Washington, DC. Dan first joined the Environmental Finance Center in 1998 as a graduate intern, and eventually assumed the role of Director. During his tenure with EFC, Dan has assisted commu-

nities throughout the Chesapeake Bay watershed and the Mid-Atlantic region in their efforts to implement and finance environmental and sustainable development initiatives. Dan's work currently focuses on developing innovative market and performance-based financing systems to reduce the cost of environmental compliance at local, state, and regional levels. Dan holds a B.A. in Economics, a Master of Environmental Policy, and a Master of Business Administration, all from the University of Maryland, College Park.

Lisbeth Fried is a program manager for the Environmental Finance Center at the University of Maryland. Prior to joining the staff part-time in September 2009, she worked as a contractor for the EFC beginning in January 2008. Her current responsibilities include managing the EFC's Sustainable Maryland Certified program, Maryland Department of the Environment's Clean Car Clinics and development and maintenance of the EFC website. Liz is former Certified Meeting Professional with more than seven years of experience planning a wide variety of meetings, conferences and events. She holds a Master of Public Affairs from Indiana University's School of Public and Environmental Affairs and a BA from Centre College, Danville, KY.

Medessa Burian is a program manager at the Environmental Finance Center. Ms. Burian joined the EFC in 2011 and currently manages the Mid-Atlantic Dray Truck Replacement Program. Ms. Burian also provides support for other EFC projects including the Sustainable Maryland Certified program. Prior to joining EFC, Ms. Burian worked as a project director for Shattuck & Associates, Inc. for 5 years where she performed technical assistance, training, capacity building, and practical evaluation for government and non-governmental health and education organizations. She received her Master of Public Health degree from the University of Maryland and her Bachelor of Science degree in Biology from Centre College in Danville, KY.

Research Faculty

Sevgi Erdoğan is a faculty research associate at the National Center for Smart Growth Research and Education at the University of Maryland. Dr. Erdoğan has been involved in several of NCSG's projects including the Maryland Scenarios Project and the development of a prototype time-dependent person-based statewide transportation network for the state of Maryland. Dr. Erdoğan earned her B.S. in Geodesy and Photogrammetry Engineering, M.S. in Civil Engineering from Istanbul Technical University, and Ph.D. in Civil Engineering from the University of Maryland. She also holds an M.S. degree in Operations Research from University of Delaware.

Sabyasachee Mishra is a research assistant professor at the National Center for Smart Growth Research and Education at the University of Maryland. He has worked extensively on several NCSG projects including; An Integrated Framework for Modeling Freight Mode, and Route Choice, the Maryland Statewide Transportation Model Development, the Maryland Scenarios Project and the Modeling Mega Region project. His research is published in national and international journals including Transportation Research, American Society of Civil Engineers and Transportation Research Board.

Staff

Jennifer Wise is a research associate at the National Center for Smart Growth. As a research associate, she is currently working on the zoning code rewrite project for the Montgomery County Planning Department. Jennifer holds a Master of Community Planning degree from the University of Maryland. She also holds a Bachelor of Business Administration degree from Emory University, with concentrations in marketing and consulting.

Raymond Hayhurst is a research associate at the National Center for Smart Growth. As a research associate, he is currently working on the zoning code rewrite project for the Montgomery County Planning Department. In addition, Raymond is developing an integrated travel demand model with transportation planners for the White Oak Sector Plan Area.

Raymond holds a Master of Community Planning degree from the University of Maryland (2011), where he was a graduate research assistant at the NCSG. He also holds a Bachelor of Arts degree from the University at Albany (2008), where he double majored in Geography and Urban Studies & Planning.

Patricia Gallivan is the GIS Coordinator at the National Center for Smart Growth Research and Education at the University of Maryland. At NCSG, Gallivan is working on the data collection, modeling, and validation of the Maryland Statewide Transportation Model. Patricia's other projects include: working on build-out scenarios for the State of Maryland, analyzing climate change and its potential impact on sea level rise in the Port of Baltimore, and a study of the commute shed for potential new large employment centers in Montgomery and Prince George's Counties. She holds a B.A. in Environmental Studies from Mount Holyoke College and a Masters degree in Geography and Environmental Planning from Towson University.

Matt Johnson is a research associate at the National Center for Smart Growth who is working primarily on Montgomery County's zoning code rewrite project. He lives in Greenbelt, Maryland, where he serves on the city's Advisory Planning Board. He holds a Bachelor of Science in Public Policy from the Georgia Institute of Technology and a Master of Community Planning from the University of Maryland. He has worked for NCSG since 2009.

Jonathan Casey is a faculty research associate at NCSG. He is part of the group of NCSG researchers working on the Montgomery County Zoning Code Rewrite Project at the Montgomery County Planning Department. Prior to joining the NCSG in June 2010, Jonathan worked as an intern and later a planning technician at the Montgomery County Planning Department, working with master planners on research and production of the Long Branch Sector Plan and Wheaton Sector Plan. He holds a BS in Geography, with a focus in environmental land management and planning from Salisbury University.

Jason Sartori is a contractor to the NCSG currently serving in the role of Associate Director. Jason obtained his Master of Community Planning degree

from the University of Maryland's School of Architecture, Planning and Preservation, where he specialized in economic development. His Bachelor of Arts degree in economics and political science comes from the University of Richmond. Over the last 15 years, Jason has managed a variety of stakeholder participation, strategic planning and research initiatives for corporations in the private sector, government agencies, and non-profit organizations. Since publication of the last NCSG progress report, Jason was the lead author on the NCSG report entitled "Smart Growth Indicators in Maryland," directed the HSG's Barriers to Development in Priority Funding Areas project, steered the Makeover Montgomery conference focused on the sustainability of America's suburbs, and led the project to redesign and develop the NCSG's website. His current NCSG projects include project management, data analysis and report writing roles for the SEED Initiative, the STAR Project and the Baltimore Sustainable Communities Initiative.

Emily Tettlebaum works remotely at the Montgomery County Planning Department as a research associate for the County's Zoning Code Rewrite Project. As a member of the project team, she drafts and edits code text, coordinates with stakeholder groups and organizes public outreach efforts. Emily is a 2010 graduate of the Master of Community Planning program at the University of Maryland and she holds an undergraduate degree in Biology from Grinnell College.

Research Assistants

PhD Assistants: **Chris Dorney, Jae Sik Jeon, Rebecca Lewis, Chao Liu, Yi Niu, Yanli Wang, Tim Welch**

Graduate Assistants: **Darcy Buckley, Zach Chissell, Allison Forbes, Steve Gehrke, Eli Knaap, Graham Petto, Kaitlyn Shulman, Matt Tingstrom**

Undergraduate Assistants: **Joe Bradshaw, Jenn Kwong, Krystle Okafor, Avery Sandborn**

Administrative Staff

Ann Petrone has been with the University of Maryland for 27 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 owned a seafood business and restaurant. She is a graduate of the University of Maryland, as are her three children. She resides in Laurel, 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 18 years as an accountant in the Contract Grant Accounting Office (2005-2008); business service specialist in the Department of Criminology and Criminal Justice (1999-2005); manager of operational accounting and staff accountant at the Center for Institutional Reform (1995-1999). Ms. Williams has a Bachelor's Degree from the University of Maryland University College.