Policy Research Priorities for Sustainable Communities
Insights and Ideas for the
US Department of Housing and Urban Development and the
Federal Interagency Partnership for Sustainable Communities

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website at www.mi.vt.edu
Preface and Acknowledgments

In the spring of 2010 the Metropolitan Institute at Virginia Tech launched its Sustainable Communities Initiative (SCI) to explore the intersection of planning, design, and policy through applied research and direct assistance to communities. After its preliminary scan of the literature and model programs, the Metropolitan Institute started to identify gaps in our sustainability knowledge with the goal of recommending research projects that would facilitate the necessary changes in government policies, industry practices and individual behaviors. At the same time, HUD’s Office of Sustainable Housing and Communities (OSHC) was developing its grant program and forging its new Partnership for Sustainable Communities with EPA and DOT. The Metropolitan Institute, together with Virginia Tech’s Center for Housing Research (CHR), began a series of conversations with OSHC and HUD’s Office of Planning, Development, and Research (PD&R) to better understand how Virginia Tech’s sustainability work could assist HUD in framing relevant research questions and policy initiatives. These discussions led Virginia Tech to convene a one-day research roundtable on September 1st, 2010.

The authors first thank the attendees of the Sustainable Communities Roundtable for volunteering their time and sharing their ideas and insights that serve as the foundation for this report. In addition, we would like to acknowledge Ed Stromberg, Regulatory Barriers and Brownfields Research; Regina Gray, Affordable Housing Research and Technology Division, Office of Policy Development and Research; and Michael Freedberg, Office of Sustainable Housing and Communities, at the US Department of Housing and Urban Development for their guidance and ideas throughout this process. We also offer a special thank you to Raphael Bostic, Assistant Secretary for Policy Development and Research, Development, and Mariia Zimmerman, Deputy Director for Sustainable Communities, Office of Sustainable Housing and Communities (OSHC) for providing opening remarks at the roundtable meeting.

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Executive Summary

On September 1st, 2010, Virginia Tech’s Metropolitan Institute and Center for Housing Research brought together more than 50 national experts and policy advocates for a one-day research roundtable with leaders and staff from HUD’s Office of Planning, Development and Research (PD&R) and Office of Sustainable Communities and Housing (OSHC). Participants were tasked with identifying the top research priorities that would support HUD and the Federal Interagency Partnership for Sustainable Communities as they develop and implement policies and programs that promote more sustainable communities.

Sustainability covers a wide range of potential policy and research topics. In light of Virginia Tech’s expertise and HUD’s policy and programmatic domains, the following three areas were selected as special breakout groups for the roundtable:

1) Accessible and Affordable Housing – strengthening the policy connections between transportation and housing;
2) Green and Energy Efficient Affordable Housing – enhancing the environmental quality and energy efficiency of housing for low- to moderate-income households; and
3) Cities in Transition – regenerating older, distressed communities through the lens of sustainability.

This report is Virginia Tech’s synthesis of the ideas and insights generated at the September roundtable. These discussions were intense, organic, and highly productive; the sessions were part focus group and part brainstorming of original ideas from a diverse group of researchers, experts, and agency officials. Limitations of time and space made it difficult to devise specific research questions; however, the participants reached a general consensus on the creation of extensive lists of potential research topics. Although preliminary priorities emerged from all three breakout groups, Virginia Tech relied on its own research briefs and a scan of relevant academic and policy literature to craft a “short list” of policy research priorities (See page 10). Of the more than 60 research ideas generated during the roundtable, the following summary of the short list represents the top three to five research topics from each breakout group:

Accessible and Affordable Housing:
1) Drivers behind individual, household, and firm location decisions - explore the influence of key determinants of location decisions and evaluate potential policy options to incorporate those determinants.
2) Policy evaluation and policy coordination research - evaluate policy, programs, and coordination strategies that foster affordable housing in accessible neighborhoods.

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1 See appendices and the Metropolitan Institute website for the more comprehensive summaries from each of the three breakout groups.
3) Development of cutting edge methods and tools - expand and adapt simulation games, decision theater, network mapping, and diffusion strategies that examines housing-transportation linkages.

Green and Energy Efficient Affordable Housing:

1) Residential energy efficiency/conservation practice and evaluation - evaluate performance and cost effectiveness of current policies and practices that retrofit existing homes and facilitate building of new green housing.
2) Capitalization, finance, and subsidy - examine how capital markets and government subsidies influence decisions about green homes.
3) Commercialization and diffusion - identify cost-effective policy interventions that can accelerate innovation, commercializations, and adoption of innovative energy efficiency practices.
4) Government Program Efficacy - identify the best management practices for creating green public and private housing through a blend of regulation and incentives.

Cities in Transition:

1) Typology of cities in transition - identify the different scales, geography, conditions, and capacity of communities experiencing varying levels and types of distress.
2) Federal and state strategies that regenerate distressed and abandoned neighborhoods - recalibrate existing federal and state policies and statutes to encourage local governments to adopt innovative strategies that regenerate severely distressed and abandoned neighborhoods.
3) State and regional economic development policy and programs - assess the current state of policy innovation and practice along with coordination and collaboration across government and agency programs.
4) State and local land use and growth management laws for weak and weakening markets - recalibrate current smart growth statutes and tools for weak or weakening market conditions so they encourage infill development and revitalization of existing neighborhoods.
5) Social and economic costs and benefits of consolidating or decommissioning public infrastructure - explore the engineering feasibility, policy options, and social justice implications of different right-sizing strategies.

The report begins with a synthesis section that sets the context and framing for the roundtable discussions. It outlines the intersection of policy and research and then define sustainability within HUD’s agency mission and the Livability Principles adopted by the Federal Interagency Partnership. After exploring the “short list” of research priorities, the report’s policy research summaries extract the more specific ideas from the original roundtable notes and Virginia Tech’s policy briefs, and places them within one of three “policy research” matrices. Each summary highlights a few of the intriguing research ideas and explains the policy connections that such relevant research would support.

2 The ideas within each matrix were generated during the roundtable discussions with relevant reframing and modest additions. The matrices are found in Appendices B, C, and D.
Reflecting the roundtable’s closing session, the report’s conclusions discuss how HUD and its interagency partners could better collaborate and coordinate existing research initiatives and resources around the theme of sustainable communities.

Virginia Tech hopes this report will provide researchers, policy advocates, and agency officials with a common framework for exchanging further ideas around sustainability research and policy development. Common ground is sometimes difficult to find given the multi-dimensional nature of sustainability and the classic silos of academic disciplines and agency missions. Moreover, the diversity of the roundtable’s participants highlighted the inherent tensions between empirical research and policy design and implementation. By the end of the day, however, the roundtable participants successfully navigated these potential pitfalls, replicating the spirit of collaboration engendered by the new federal interagency partnership.
PART ONE: OVERVIEW AND SYNTHESIS

The Intersection of Research and Policy—Framing the Roundtable and Report

One of the roundtable’s special features was the mix of researchers with policy experts and advocates. While the discussions rested on a solid research foundation, they were guided by recent developments within the field of sustainability and by the evolving demands of community leaders in pursuit of sustainable communities. Policy advocates often identified a wide range of current sustainability policies and programs they would like researchers to evaluate. Researchers responded by developing and then reframing a menu of potential research topics that could shed light on the effectiveness or performance of these policy initiatives. As reflected throughout this report, the roundtable provided the rare opportunity for mutual learning and collaboration as both policy advocates and researchers could better understand the framing of empirical research within the context of current political and policy conditions on the ground.

Sustainability Policy and Livability Principles

Within the last twenty years sustainability has become the pivotal policy paradigm of our generation. Sustainability’s shorthand definition rests on three interdependent elements—environment, economy, and equity—often known as the three pillars of sustainability. Researchers and policy makers continue their search for consensus around a more precise definition as sustainability is so broad and flexible that it can seemingly include a multitude of planning and policy topics such as energy efficiency, reduction of green house gas emissions, brownfields redevelopment, green jobs, and equitable redevelopment.

At its core, sustainability revolves around important environmental principles such as ecological carrying capacity, natural capital, and harmony with natural systems. These principles share a common operating premise that the Earth’s resources are not limitless and that current development patterns and rates of growth and consumption are out of balance, generating a host of adverse economic, environmental, and social consequences.

From a policy perspective, sustainability seeks an equilibrium that places environmental and social equity outcomes on par with economic and development considerations; therefore, the quest for sustainable communities requires a holistic set of policies that harmonize these outcomes. The design and development of the built-environment must be more efficient so that reasonable rates of growth are based on cumulative ecological capacity and measured by balanced environmental and economic inputs and outputs. More importantly, principles of social equity, community engagement, and livability must guide the process of developing sustainable communities.
HUD adapted several of these sustainability precepts\(^3\) within its central agency mission to expand housing opportunities that are affordable, energy efficient, and provide access to a range of valuable community services. Given the complexities and multiple meanings surrounding the term sustainability, the roundtable adopted the definition of sustainability from HUD’s FY10-15 Strategic Plan:

*For the Department, “sustainability” means ensuring that the land that we build on is clean; the investments we make in neighborhoods help residents lead healthy, safe, affordable and productive lives; the buildings we invest in are energy efficient and healthy; and the regions we support are economically strong and provide opportunities for all residents to actively participate.*

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**Pieces of the Sustainability Puzzle**

Opening remarks by HUD’s Raphael Bostic, Assistant Secretary for Policy Development and Research, Development, and Mariia Zimmerman, Deputy Director for Sustainable Communities, Office of Sustainable Housing and Communities (OSHC) stressed the relevance for having a roundtable that explored the intersections of research and policy and explained how the roundtable discussions could help HUD meet its sustainable communities’ policy and research goals. Dr. Bostic acknowledged HUD Secretary Donovan’s priority to have a strong and reliable empirical basis for developing policies and for understanding the implications of those policies. In light of the watershed initiatives of the Obama Administration, such as the HUD-DOT-EPA Interagency Partnership for Sustainable Communities, “quality research will be critical to the success of sustainability-related policies.” Dr. Bostic also recognized that over the years PD&R has conducted and coordinated several successful research projects and reports that have furthered our understanding of sustainability, such as the Partnerships for Advancing Technology in Housing (PATH) and numerous regulatory barriers studies and reports; for example, PD&R is collaborating with the Federal Transit Administration on two congressionally-mandated studies addressing affordable housing and transportation issues.

OSHC Deputy Director Zimmerman noted the diversity of the roundtable participants—from universities, think tanks, advocacy groups, agency leaders/staff—and that each group owns a “piece of the sustainability puzzle.” She provided a brief recap of HUD’s Sustainable Communities Initiative and the formation of the Interagency Partnership to “create a strong economic foundation and accelerate job growth by expanding housing and transportation choices and supporting greater energy independence.” Deputy Director Zimmerman stressed that these unprecedented collaborations among federal agency leaders and staff are helping build regional and local capacity to support more sustainably-related policies and programs, especially the creation of more coordinated and integrated planning frameworks and processes. Research that evaluates and supports these programs on the ground and also directly involves practitioners in the process will be essential in furthering the design and development of innovative sustainability policies. OSHC and PD&R are working closely to ensure research initiatives complement the Sustainable Communities Initiatives.

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In selecting the three breakout topics Virginia Tech also consulted the Federal Interagency Partnership’s six guiding “livability principles.”

- Provide more transportation choices.
- Promote equitable, affordable housing.
- Enhance economic competitiveness.
- Support existing communities.
- Coordinate and leverage federal policies and investment.
- Value communities and neighborhoods.

Cross cutting themes derived from these livability principles, such as transportation and housing choice together with economic vitality of existing communities, were raised throughout the roundtable discussions (See text box).

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The Livability Principles at Work

In creating the new interagency partnership, HUD, DOT and EPA developed these six livability principles to ground their collaboration within the federal government as well as frame their engagement activities with communities. The principles themselves echo important community values about the sense of place, the diversity of communities and economic competitiveness—jobs and businesses—that sustainability policies can foster.

These principles also guided the awarding of nearly $100 million in HUD Sustainable Communities Regional Planning Grants in October, 2010. Many of the 45 regional grantees include projects that establish stronger housing-transportation linkages and provide greater choices for equitable and affordable housing. Together with HUD’s Sustainable Communities challenge grants and DOT’s Tiger grants, these regional grants serve as a living laboratory for aligning federal policies and resources. As Secretary Donovan emphasized, “When it comes to housing, environmental and transportation policy, its time the Federal government spoke with one voice.”

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A Short List of Policy Research Priorities

Given the breadth of research topics generated at the roundtable, Virginia Tech, with input from several participants, crafted a short list of research priorities for HUD and its interagency partners to consider. This list identifies several strategic questions that are critical in facilitating meaningful policy reforms and building the foundation for a sustainable communities research agenda (for the complete list of research topics generated in each breakout group, go to Appendices B, C, and D). In order to qualify for the short list, the research had to address one or more of the following requirements:

- Strategic policy and program barriers that impede the design and/or implementation of effective sustainability policy;
- Critical research barriers (e.g., data gaps, data resources, better models, and methodologies, etc.) that must be addressed before moving forward with other research projects or policy initiatives;
- Diffusion of policy innovations, the transfer of model programs and practices, and the promotion of policy change;
- Federal policy levers within the purview of HUD and its interagency partners or the ability of federal agencies to influence policy change by other institutions and entities (state, regional and local governments, nonprofits, and the business sector);
- Linkages that would strengthen policy integration and policy coordination;
- Promotion of one or more of the Interagency Partnership’s six Livability Principles.

Accessible and Affordable Housing - strengthening the policy connections between transportation and housing

Accessibility refers to the extent to which households can feasibly reach employment destinations, high quality environmental amenities, and public services from their homes without having to rely on automobiles. Accessibility also implies an emphasis on inclusivity and fairness, such that housing and employment opportunities, as well as public and natural amenities, are available to all households. As such, accessibility can be viewed as a key component of sustainable communities given its emphasis on the social and economic opportunities facing low- to moderate-income households. This breakout group focused on the research and policy issues associated with promoting housing that is both accessible and affordable to low- and moderate-income households (see Appendix B for the complete priority list).

Research Priority One: Drivers behind individual, household, and firm location decisions

One of the major areas examined during the roundtable was how policy-induced changes in housing and transportation choices will affect household and business location choices. A top research priority for HUD and its interagency partners is to improve their
understanding of how individuals, households, and firms make location decisions, given preferences, prices, and personal, market, and policy constraints. Identifying the factors that influence such pivotal decision-making will establish essential knowledge that can help develop new affordable and accessible housing policies and programs, as well as facilitate the recalibration of existing ones.

Therefore, the research questions within this priority area should identify key determinants of location decisions and evaluate the potential for future governmental policies and programs to incorporate those determinants. Potential research topics could include:

- The role and/or impact of accessibility (as it relates to transportation; access to goods, services and resources; connectivity; and urban design) on agents’ location decisions. For example, proposed research projects could include a meta-review of location decision-making processes of individuals, households, and firms.

- The role of preferences (i.e., individual and societal level factors such as demographics, ethnicity, gender, housing or transportation preferences, etc.) in influencing housing or firm locations; the rise of prices (i.e. market or economic factors) in influencing real estate industry stakeholders’ development decisions; or the effect of constraints (i.e. land use policy or infrastructure) on sustainability investments.

**Research Priority Two: Policy evaluation and policy coordination research**

After garnering a more robust understanding of the factors that influence location decision-making (based upon Research Priority One), the second research priority should focus on evaluation methods that can identify successful policies, programs, and coordination techniques which foster affordable housing in accessible neighborhoods. The goal of this priority area (in tandem with Research Priority One) is to streamline HUD’s current policies and programs by increasing the efficacy of existing programs; identify ineffective policies or underperforming programs; and inform future funding allocations. Research topics could include:

- A policy analysis of existing HUD and related DOT and EPA programs and policies that influence accessible or affordable housing. Additionally, this research priority area could also incorporate case studies of successful affordable and accessible housing practices of cities, regions, and states within the US, as well as internationally.

- Identification and evaluations of barriers and enablers to successful policy coordination, both at the vertical and horizontal scales.

**Research Priority Three: Development of cutting edge methods and tools**

The third research priority is not substantive but rather procedural. In order to better facilitate the successful execution of the research within Priorities One and Two, HUD and its interagency partners should identify appropriate, cutting edge methods and tools to
enable research on accessible and affordable housing, elevate the accuracy and robustness of findings, and pave the road for more evidence-based practice, accountability, and transparency. Relevant research topics within this priority area could include a review of existing research approaches or existing policy evaluation tools with recommendations for improvements, as well as a better understanding of innovations (e.g. simulation games, social media, diffusion of information, etc.) that could impact accessible and affordable housing.

**Green and Energy Efficient Affordable Housing - enhancing the environmental quality and energy efficiency of housing for low- to moderate-income households**

Current building and housing construction, together with the design, placement, operation, and maintenance of such structures consumes significant amounts of energy and produces the majority of urban greenhouse gases. The housing-environment nexus is accentuated by the durability of housing and a host of other externalities, such as consumer preference, capital markets/development financing, and government subsidies that drive what gets built, maintained, or renovated, and where such construction occurs. Green and energy efficient housing acknowledges the environmental and economic importance of increasing the sustainability of housing across price ranges, as well as the affordability benefits that green housing can potentially produce through lower utility, transportation, and maintenance costs.

This breakout group examined these housing/energy connections through a holistic framework that included different scales (structure, lot, subdivision, neighborhood, village, city, region); the age of housing (new construction and renovation-retrofit); engineering and housing design; and capitalization and housing finance. Beyond the policies affecting the structure, they explored issues involving all segments of demand, spanning demographic and economic characteristics; human and social factors from the individual through neighborhood; and governance (policy, regulations, and incentives) (see Appendix C for the complete priority list). In light of this comprehensive approach, Virginia Tech organized the breakout group’s research priorities into four topical categories:

- residential energy efficiency/conservation practice and evaluation;
- capitalization, finance, and subsidies;
- commercialization and diffusion; and
- government program efficacy.

Three overarching and interrelated problems were addressed for each of the four priority areas: 1) meta-reviews of the current state of empirical knowledge; 2) identification of key gaps in current research; and 3) the need for primary data collection. Meta-reviews are critical to clarify the state of current research knowledge, building on published research summaries where available. These reviews will clarify the current knowledge base and
improve the accuracy of perceived research gaps identified during the roundtable. They will also help refine the scope and nature of any primary data collection. The following research topics provide a cohesive research strategy for HUD and its interagency partners to consider.

**Research Priority One: Residential Energy Efficiency/Conservation Practice and Evaluation**

One of the first research priorities focuses on the energy performance and cost-effectiveness of residential energy retrofit/renovation technologies and practices by building characteristics (e.g., regional location, type, age, multi-family/single-family, renter/owner). For example, what technologies and practices are most effective in these different settings and conditions?

- Within the context of energy retrofit technologies and practices, we recommend the meta-analysis of two pivotal research topics: (1) **Retrofits**: evaluations of weatherization and utility retrofit programs. What do the decades of experience in these programs tell us about technology, practice, and implementation? and 2) **New Construction**: evaluations of new affordable housing construction policies by HUD’s PATH and DOE’s Building America, along with other similar programs. What does the experience from these programs tell us about affordable technology, design, and practice?

- The impact of occupant behavior in affordable comfort and energy efficiency: How do behavioral interventions (e.g., education, real-time metering display) affect energy savings? To what extent does the “rebound effect” impact energy savings of affordable housing retrofits?

- The interaction between/among technology innovation, green rating systems (e.g., LEED, HERS, Energy Star, Home Energy Score), building codes/standards, and affordable housing markets: How do new energy technologies affect codes and market penetration? How do rating systems affect new building and retrofit practices and codes? How can codes and standards affect both new and retrofit markets?

**Research Priority Two: Capitalization, Finance, and Subsidy**

Capital markets greatly influence green construction and building practices. However, little is known about the state of the capital markets in relation to green housing (single-family and multi-family) products. We suggest three major research topics to provide HUD, DOE, and the development industry with important knowledge about how capital and program subsidies influence decisions about green housing made by developers and consumers:
Mortgage and Equity Investments: What drives investment in green products for owner- and renter-occupied housing, especially for affordable housing developments?

Accrual of Benefits: To whom do investments in energy efficiency agglomerate and how do agglomeration patterns influence investment or adoption decisions?

Subsidies and Energy Efficiency: Do current subsidy programs and policies provide sufficient incentives for encouraging consumption of green products? How do property conditions and ownership characteristics (age, quality, etc., of housing stock) impact the savings from energy efficiency interventions and thus the effectiveness of incentives designed to promote energy-efficiency? What is the “information” elasticity of demand for energy-efficiency?

**Research Priority Three: Commercialization and Diffusion**

What public interventions are cost effective in accelerating innovation, commercialization, and adoption of innovative energy efficiency practices? Can innovation and commercialization cycles for green housing be accelerated? What would be the key points for intervention?

**Research Priority Four: Government Program Efficacy**

What are the most effective administrative and management approaches for increasing agency efficacy? What principal-agent approaches produce the best results?

- What are best management practices for creating green housing through regulatory or subsidy interventions?
- What are best management practices for greening the housing inventory that is publicly owned, operated, or funded?

**Cities in Transition – regenerating older, distressed communities through the lens of sustainability**

Severely distressed cities and declining suburbs present different sets of policy challenges compared with communities experiencing steady growth and development. For decades, the policy prescriptions for these ‘cities in transition’ have involved a mix of blight removal, urban renewal, redevelopment, workforce training, and business attraction strategies. Despite numerous revitalization programs and projects, existing urban policies have yet to stabilize neighborhoods or rebuild the markets in our nation’s most distressed cities. This special class of cities is grappling with the impacts of severe economic distress that makes them less resilient to traditional economic peaks and declines. With the recent foreclosure crisis, blight and urban decay is now gaining ground in many first tier suburban communities.
In light of these diverse dimensions, this group devised a place-based urban policy framework that could guide future research activities of HUD and its interagency partners. The group identified two general types of cities in transition (CiT) that demand closer examination—those experiencing severe and chronic socioeconomic distress (typically older industrial cities that have steadily lost population, jobs, and industries over several decades) versus those relatively stable communities that are experiencing acute decline caused by the recent economic and housing crises.

Two important variables should be examined when designing policy research for the acute and chronic cities in transition: 1) regional and metropolitan market dynamics; and 2) variations among neighborhood conditions and demographics. Existing research indicates that some cities in transition exist within regions that are also declining, while other cities exist within regions that are growing. Acute and chronic cities in transition also have neighborhoods confronting tremendous change and distress next to neighborhoods that are relatively stable with vital community assets. From a policy perspective, these two variables are important as cities with different trajectories call for different policy responses and as intervention in one type of neighborhood affects adjacent neighborhoods. Therefore, any meaningful place-based research agenda must take into account these dynamics.

Based on this preliminary framework of community types, the group identified three scales of policy interventions and strategies that research should examine: 1) federal and state; 2) metropolitan and regional; and 3) community wide and neighborhood scale. After its preliminary brainstorming, the group selected 20 high priority research topics (see Appendix D for the complete priority list). Building on this list, the five research priorities below offer a critical starting point for developing a policy research agenda tailored to address the special circumstances of cities in transition.

**Research Priority One: Typology of Cities in Transition**

In designing a place-based urban policy for cities in transition, research must identify the different challenges, conditions, and capacity of communities experiencing varying levels and types of distress. Such information would help identify the appropriate scale and different types of policy interventions. We would suggest a two-step research approach:

- Conduct a meta-analysis of existing research on neighborhood, community, and regional socioeconomic and demographic indicators. This research should scan multiple disciplines (e.g., planning and urban affairs, law, education, policy, public finance, engineering, criminal justice, sociology, economics, housing and community development, environment and natural resources, etc.) and synthesize the experience of existing neighborhood indicator initiatives and programs. Such research will aid policy makers in monitoring changes and deciding when and how to intervene; it will assist researchers in evaluating such interventions.
- Develop a typology of cities in transition taking into account different scales (regional, community, neighborhood), geography, size, and trajectory. In addition
to the physical conditions, this typology should also profile the challenges of the residents in terms of poverty, education, and health so that appropriate policy interventions can address the special social equity challenges of these communities. This type of project lends itself to community-based participatory research supported by partnerships with local practitioners and policy makers.

**Research Priority Two: Federal and state policy and program incentives to encourage local government adoption of innovative strategies that regenerate severely distressed and abandoned neighborhoods**

A number of cities are experimenting with new strategies, such as land banking and regeneration planning that can help reclaim and repurpose vacant properties, especially in neighborhoods with substantial abandonment. Other cities struggle with how to aid displaced residents and businesses. Many local governments, however, do not have sufficient state enabling legislation or the capacity to implement these policy innovations.

- Policy research could first identify and then evaluate existing examples and model programs along with inventories of relevant state laws.
- Results from this research could help federal and state leaders recalibrate existing programs and even develop model legislation that would offer incentives for local governments to expand adoption of and encourage experimentation with these essential neighborhood regeneration strategies.

**Research Priority Three: State and regional economic development policy and programs**

Economic development and redevelopment remains the primary policy prescription for many cities in transition; however, little is known about the current state of policy innovations and practice. Given the economic dislocation caused by the loss of manufacturing industry in the Rust Belt or the housing industry in the Sun Belt, understanding how state and regional economic development policies are working in these different markets could enable cities in transition to adopt more sustainable economic strategies, such as renewable energy, urban greening, and urban agriculture. This analysis is especially relevant in light of the typology proposed in Research Priority One.

- Research could assess how the field has progressed, or not, over the past several decades and to what extent it still encourages "big-bang" development strategies, such as convention centers and sports stadiums over green businesses and green jobs.
- Another important area of inquiry is the prevalence of innovative economic and workforce development policies, such as regional clustering, energy conservation job training, and business incubators. Do regional initiatives involve more holistic policy design that integrates housing and community development with economic development or area-wide, place-based reclamation of brownfields and greyfields?
Within the field, little is known about policy integration across government and agency programs or collaboration among regional and local practitioners. Do regional and local economic development leaders, planners, and land use experts exchange strategies regarding reclamation of urban land in ways that support regional economic development goals and strategies?

Research Priority Four: State and local land use and growth management laws and policies for weak and weakening markets

Many CiTs are found within weak market regions where sprawl development patterns attract residents and business away from large and small cities, thereby contributing to their socioeconomic decline. Current state and local land development and growth management statutes and policies, however, were designed to mitigate and manage communities undergoing increasing rates of growth and development.

Policy research could assess current planning and policy strategies (e.g., impact fees, adequate public facility ordinances, urban growth boundaries, etc.) to determine how they might operate within weak market regions or regions with weakening markets.

Could state and local governments redesign or recalibrate current smart growth, economic development, and transportation policies and programs so they enable market stabilization, neighborhood transformation, and infill development within weak metropolitan economies and discourage new greenfield development in the exurban areas?

Research Priority Five: Social and economic costs and benefits of consolidating or decommissioning public infrastructure in abandoned neighborhoods.

Several communities, most notably Cleveland, Detroit, and Youngstown, are now exploring the feasibility of consolidating or decommissioning surplus public infrastructure (sewer, roads, utilities, etc.) and reducing municipal services to abandoned neighborhoods. Such a controversial policy raises a number of potential research questions:

What is the engineering feasibility of such a right-sizing strategy and how it might affect the integrity and functionally of the entire system? Solid research could provide policy makers with vital information in making informed decisions about whether to adopt and how to implement such a strategy. Would it be prudent to mothball infrastructure as opposed to decommissioning it?

Would the economic benefits, such as municipal budget savings, be sufficient to offset short- and long-term costs?

What are the social costs for relocating existing residents and business to areas with municipal services versus allowing them to remain in abandoned neighborhoods? Could a private-maintenance agreement support allowing existing residents to remain?
Careful analysis must also address the social justice issues surrounding relocation and the process for engaging the remaining residents in determining their own future. Could incentives be devised that would actually improve the quality of life for current residents?
PART TWO: POLICY RESEARCH SUMMARIES

After analyzing the summaries from each of the three breakout groups, four common research themes emerged across all the topic areas that merit attention: 1) Current State of Knowledge; 2) Data; 3) Metrics and Performance Measurement; and 4) Research Design. All of the research issues and ideas fit within one or more of these four categories. In particular, all three breakout groups identified mutual data and methodological challenges that must be understood and key research design strategies that should be addressed as HUD and its interagency partners develop their sustainable communities research agenda.

Building upon the Current State of Knowledge:
All three breakout groups strongly believed that researchers and policy makers must first inventory the state of knowledge surrounding sustainability, especially as it pertains to HUD’s mission and the Interagency Partnership’s Livability Principles. The consensus was to establish what is known (with respect to sustainability policy and research questions) and identify the gaps in the current knowledge-base. In particular, many workshop attendees strongly recommended that a “meta-analysis” (e.g. a systematic review of academic and advocacy research in which a synthesis of existing findings is produced) be conducted to better understand the existing programs and interventions that support and further sustainability goals. For example, meta-analyses could include:

- TOD best practices and case studies
- An inventory and evaluation of new, energy efficient, affordable housing construction programs
- An inventory and evaluation of energy weatherization and utility retrofit programs
- Creation of a Cities in Transition typology

Examples of existing meta-analyses include:


Further, many participants believed HUD and its interagency partners should also examine international programs and policies for relevant lessons that could pertain to American sustainable community initiatives. Examples include Freiburg, Germany’s leadership as a solar city, Copenhagen’s extensive network of urban cycling routes and infrastructure, and Mannheim, Germany’s district heating initiatives. Relevant lessons from the regeneration of Manchester, UK, Torino, Italy, and Leipzig, Germany could inform the development of innovative policies for American cities in transition.
Note that Virginia Tech did not conduct a formal literature review prior to developing the background material for the workshop. Nevertheless, conducting a meta-analysis is a critical foundational step to ensure that federal agency research resources support such analysis and that it builds on the current state of knowledge. Additionally, any deep analysis of existing research should acknowledge the transdisciplinary nature of sustainability by supporting collaborations across academic disciplines.

Data:
All three breakout groups strongly urged that HUD and its partners strive to improve the quality of and access to data. In particular, there were resounding calls for:

- Better data management and synthesis, including making significant movement toward open source data
- Creating a repository of findings
- Establishing consistency across data mining methods and moving toward standardization of data
- Creating a streamlined system for data integration and compatibility
- Supporting, incorporating, and utilizing more micro-level data sources

For example, participants recommended:

- Designing travel surveys for better use in local area housing and transportation decision-making, incorporating more micro-level data
- Developing a better way to accurately measure transit use in existing housing surveys
- Standardizing data collected from HOPE VI projects

Finally, some of the discussion around data focused on how information about transportation, housing, and energy could benefit from the bioinformatics model. In the end, many participants believed that current sustainability research and data are too dispersed and proprietary and that HUD should look to viable commercial platforms in other industries to assist in the standardization of data formats. While the issue of data management may be out of HUD’s distinct purview, it may be something that the federal partnership could collectively address especially as better data contributes to the goals of better metrics.

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4 Bioinformatics uses varied computational and statistical techniques to solve problems arising from the management and analysis of biological data. Informatics is a relatively new discipline that studies the structure, behavior, and interactions of natural and artificial systems which manipulate information.
Metrics:
Throughout all three discussions, the need for empirically-based metrics emerged as a common theme. Attendees strongly believed that we need a common denominator for comparison:

- What common metrics and scales could be utilized to disseminate consistent, standardized information and findings (e.g. $X$ savings/square feet is not always uniform across the scale of the building)
- Establish criteria to identify and better assess the different characteristics and stages of cities in transition

Participants across all three groups also observed that metrics should be devised at multiple scales (project level; neighborhood or place level; city, metro, region, state, and federal). Further, attendees concluded that we need to identify key metrics that facilitate change but also assess the impact or effectiveness of establishing or utilizing those metrics:

- Do house specific metrics (e.g., rating systems), systems level (e.g., HVAC), utility scale, and occupant comfort impact behavior/sales price?
- How do community health indicators impact policy?

Research Design:
In discussing potential research questions that could help inform and support the Interagency Sustainability Partnership’s strategic plan, two types of research approaches warrant mention.

The first was striving to delineate and understand the factors that impact various agents’ behavior/investment/policy decision-making so as to better guide policy design and implementation, especially for the programs managed by HUD and its interagency partners. The questions included:

- What factors impact residents’ location, transport, and employment decisions?
- How does consumer-based education and marketing influence housing and transportation costs?
- How do various government subsidies interact to impact behaviors, such as tenants, businesses, and institutions?
- What factors facilitate the adoption of innovative urban regeneration policies by mayors and other local elected officials?

The second was to conduct program evaluation, including case studies, best practices, policy impact analyses, and accountability assessments:

- What are the costs, benefits and overall effectiveness of HUD policies and programs that encourage energy retrofitting of existing housing stock
- What are the best practices of federal/state policy integration and planning
coordination that facilitate alignment of program activities at different scales—state, regional, local, etc.?

What is the impact of Energy Tax Credits on furthering sustainability efforts?
AFFORDABLE AND ACCESSIBLE HOUSING

Content Facilitators: Ralph Buehler and Casey Dawkins, Virginia Tech
Lead Facilitator: Elizabeth Schilling, Urban Associates
Section Contributors: Mariela Alfonzo, Ralph Buehler, Casey Dawkins
See Appendix B for a complete list of policy research topics

Overview

The Affordable Housing and Accessibility breakout group began with an overview of the term “accessibility” to establish the context for discussion. Content facilitators Dawkins and Buehler broadly defined accessibility as the “ability of households to reach employment destinations, high quality environmental amenities, and public services and businesses from homes without reliance on automobiles.” Additionally, the facilitators noted that accessibility implies inclusivity and equity, whether in the context of housing or transportation. Within the context of sustainability the goal was to understand the relationship and policy linkages between housing and transportation so they further environmental, economic, and social equity outcomes. The facilitators presented three categories or scales of research topics that were delineated within the Virginia Tech briefing materials: 1) individual or household scale, 2) regional planning scale, and 3) federal policy scale.

Summary of Findings

Building on the framework set by the facilitators, the participants expanded the list of potential research categories and variables, such as the metropolitan and mega region scales, institutional and governance barriers, infrastructure, demographic preferences, and planning mismatches. The facilitators adapted the original categories to reflect the pertinent research issues suggested by the participants to include the following three major categories:

Agent decision-making: These research questions aim to understand how the decision-making process of individual actors (e.g. households, lenders, investors, developers, employers, etc.) is impacted by:

- Economic/Cost/Market Factors
- Land Use Policy and Infrastructure
- Individual/Societal-level factors

This level of inquiry seeks to uncover how prices, preferences and constraints affect people’s, households’ and firms’ decisions about housing and transportation. Generally, these questions examine issues such as: why an employer would choose to locate in a transit node; what influences people’s residential location choices; how households, employers,
and developers make investment and location decisions; how housing, employment, and transportation choices change over time due to shifts in demographics, information, regulation, infrastructure, and cost; and how to facilitate the movement of jobs to people.

Policy Evaluation and Coordination: These research questions aim to understand the impacts of policy on issues of accessibility and affordability. For example, how current policy coordination, or lack thereof, across vertical (federal, state, and local) and horizontal (across agencies) scales impacts the implementation of programs or initiatives related to accessible and affordable housing. HUD and its interagency partners manage dozens of programs and policies that positively and negatively influence the relationship of accessible and affordable housing and transportation. HUD and DOT grant programs, such as CDBG, HOME, and the Surface Transportation Program appropriate billions of dollars each year to regional and local governments to support the construction of roads, transit and affordable housing. Yet, the planning requirements and processes for these different federal and state housing and transportation programs rarely intersect with each other, making it difficult to coordinate and leverage investments in a way that facilitates sustainability goals and outcomes.

New Methods: Subsumed within the Accessible and Affordable Housing research area are a series of questions that did not fall within the two identified categories. Instead, these research topics propose ideas for new research methodologies, decision tools, and evaluation approaches to better understand accessible and affordable housing issues. Relevant topics could include a review of existing methods and new tools that pave the road for more evidence-based practice, such as simulation games, social media, decision sciences, and network mapping.

Framing Evidence-Based Questions

The group found that several research questions reflected underlying normative assumptions or judgments about certain policies or land-use patterns. It revised those questions and adopted more objective language. For example, in asking the question “What financial tools or regulatory incentives facilitate mixed-use, mixed-income, and affordable housing?”, one assumes that the preferred policy objective is mixed-use housing. However, the primary goal is to better understand the relationship between land-use patterns and the accessibility and affordability of housing. Alternately, this type of research question could be reframed to focus on understanding what factors (policy, or otherwise) facilitate (or create barriers to) a desired outcome (as they relate to HUD’s stated sustainability goals). Moving forward, while research questions and programs can and should be targeted around understanding how to realize HUD’s mission, they should be objective and free of bias. Further, HUD should continue to support evidence-based research that will inform and improve the state of transportation, land use, environmental, and housing policies.
GREEN AND ENERGY EFFICIENT AFFORDABLE HOUSING

Content Facilitators: Ted Koebel and John Randolph, Virginia Tech
Lead Facilitator: Kathryn McCarty, Virginia Tech
Section Contributors: Ted Koebel and John Randolph
See Appendix C for a complete list of policy research topics

Overview

The Green and Affordable Housing breakout group began with a prioritization of issues and questions from the list of suggested topics. The original list of topics was developed around these six categories: engineering and design; capitalization and finance; planning and governance; consumer behavior, occupancy and operation; stewardship, social capital and community building; and commercialization and diffusion. The group discussed the relevancy of other topics, including environmental impact and benefits, health and safety, consumer behavior, and public health and building codes. Participants also reviewed a list of specific research issues and questions that were nested within each category, which served as a starting point to help identify which questions were the most pressing to pursue through future research. With guidance from the facilitators, participants decided to rearrange the original six categories into three areas, including market interventions, performance indicators, and impact of affordability.

Findings

The symposium revealed a lack of consensus on the definition and state of affordable and green housing research. Lacking clarity on the knowledge base, especially in the context of the new interagency partnerships, it seems prudent to suggest conducting meta-reviews for the key thematic areas identified in the symposium:

- Residential energy consumption;
- Capitalization, finance, and subsidy;
- Commercialization and diffusion; and
- Government and agency efficacy.

Priority should be given to developing the first two reviews (energy consumption and capitalization) as these are interdependent and will help frame the reviews of commercialization and efficacy. Additionally, these meta-reviews would provide a framework for exploring other research questions generated by the participants.

HUD sponsored meta-reviews would also help establish what is known about the thematic areas identified in the symposium and identify those models emerging from empirical research that can improve the identification, documentation, and replication of best practices to promote evidence-based policy and planning. These reviews would establish a
solid foundation for creating road maps for future research and establishing priorities for federal research funding.

After conducting the meta-reviews, the next step is to establish research road maps for short- and long-term development and funding. It is important to transition quickly from meta-reviews into research priorities to generate momentum and knowledge. These reviews can be completed with strategically applied funding, careful selection of reviewers, and appointment of independent advisory committees for each.
Overview

The Cities in Transition (CiT) breakout group was tasked to identify priority research issues that would help HUD and its interagency partners develop new policy and programmatic approaches that can further principles of sustainability while revitalizing neighborhoods and rebuilding markets; thus, the fundamental policy complexities and imperatives for CiTs can easily overshadow the sustainability issues from the other two breakout groups.

Existing academic literature has helped define and describe the challenges of “shrinking cities” based primarily on sustained population loss and significant inventories of vacant properties, but the policy challenges of urban decay and distress have now taken on new forms and have spread to suburban communities. Therefore, the focus for the CiT breakout group was to identify elements of a place-based urban policy framework for how these diverse communities can preserve and protect stable neighborhoods while rebuilding, and in some cases reconfiguring, their most distressed neighborhoods.

Emerging green initiatives indicate that sustainability could offer a galvanizing vision and a holistic policy and planning framework that could catalyze the regeneration of cities in transition. HUD and its interagency partners oversee a myriad of community and economic development policies and programs that could be recalibrated to strengthen the connections between sustainability and urban regeneration. Recent research is also exploring how older, distressed cities could play a “distinctive and vital role” in a low-carbon world as these communities move towards local agriculture, distributive renewable energy, and compact, transit oriented villages. Neighborhood-scale and city-wide greening initiatives could further rejuvenate the contaminated urban ecology, stabilize dysfunctional markets, and reconfigure the excessive physical footprint found in many cities in transition.

In the beginning of the session, participants noted that CiT challenges have only recently become a vital part of the planning discussion and urban policy debate. In fact, many CiT strategies, such as right sizing and land banking, represent radical shifts in urban planning – a new way of thinking about metropolitan, suburban, and rural places. Given the multiple challenges confronting CiT, participants discussed the ways in which public sector interventions could shift dynamics in communities that have historically witnessed major disinvestment. In other words, participants raised the question of how to make
“sustainability” meaningful in a place like Gary, IN or Youngstown, OH. Finally, considering the current complexities confronting CiTs and the inevitability of cities growing smaller, the participants felt that different policy interventions were required at different scales and different levels (federal, state, regional, and local). Unfortunately, it seems that CiT within the US have little experience with well-tested and effective place-based programs and policies. Thus, the more immediate challenge for HUD and its partners is devising a cohesive, CiT policy framework while communities are simultaneously experimenting with a wide range of ideas.

Summary of Findings

Participants identified a series of overarching problems that provide the context for developing a place-based CiT research and policy framework:

1. The chronic fiscal stress of local government finances, public services, and resources make it difficult to stabilize and rebuild the diverse neighborhoods within CiTs. Fragmented and fiscally unsound local governments pose serious barriers to the regeneration of many CiTs, especially in light of ongoing state budget cuts.

2. The declining capacity of local governments and community-based organizations within CiTs make it difficult to address the socioeconomic challenges of distressed neighborhoods. As public revenues decline with population losses and property abandonment, many local governments lack the capacity to provide essential municipal services, let alone execute strategic regeneration or sustainability policies and programs. The strength of current community based organizations can also vary significantly among CiTs.

3. Misplaced local government policy priorities and inappropriate economic development strategies in many CiTs did not match current economic assets and workforce strengths. Participants observed that several CiTs have overly relied on large scale, signature development initiatives, such as sports stadiums, convention centers, and waterfront redevelopments that were not attentive to the realities of regional markets and neighborhood context.

4. Significant racial polarization remains in many CiTs. Stigma from urban renewal and public housing projects often inhibits local leaders from taking bold, but necessary policy and planning actions. Thus, any place-based policy framework must not only acknowledge these past mistakes, but actively engage community leaders and residents in the design and implementation of neighborhood-driven regeneration and sustainability strategies.

In light of these diverse dimensions, the CiT group devised a place-based, urban policy framework that could guide future research activities of HUD and its interagency partners. The group identified two general types of cities in transition that demand closer examination—those experiencing severe and chronic socioeconomic distress (typically older industrial cities that have steadily lost population, jobs, and industries over several decades) versus those relatively stable communities that are experiencing acute decline
caused by the recent economic and housing crises. Given these two general community
types, the group identified three scales of policy interventions and strategies that research
should examine: 1) federal and state; 2) metropolitan and regional; and 3) community wide
and neighborhood scale. After its preliminary brainstorming, the group refined its list by
selecting 20 priority research topics.
PART THREE: MOVING TOWARDS A SUSTAINABLE COMMUNITIES RESEARCH AGENDA

At the end of the day participants gathered to share major themes from their individual breakout discussions and offer suggestions on how HUD and its interagency partners could leverage these ideas into a robust, sustainable communities research agenda. Although the policy research ideas were specific to each of the breakout topics, four strategic opportunities and priorities emerged: 1) Drivers of Change, 2) Diffusion of Innovation, 3) Policy integration and Coordination, and 4) Sustainable Planning and Federal Grantees.

Roundtable participants also observed that HUD and its interagency partners have different institutional and programmatic drivers that influence their policy priorities and as a result the framing of research and eventual policy translation. Activities of the new interagency partnership have certainly helped foster new levels of collaboration and bridge these differences; however, many of the barriers to interagency collaboration are embedded in sometime misaligned agency missions and a patchwork of often competing congressional authorizations.

Strategic Opportunities and Priorities

**Drivers of Change:** Understanding the important drivers and strategic intervention points is critical to the successful design and adoption of effective sustainability policies; for example, what types of policy interventions would encourage changes in the behaviors of individual consumers, households, or business practices that might lead to better sustainability policy outcomes (e.g., green buildings or purchasing homes near transit). Each breakout group identified pivotal actors and different intervention or decision points (e.g., consumers, property owners, landlords, local governments, etc.) that could facilitate significant sustainable change if they were given the right mix of incentives and support; however, more research on the impacts and interaction among these incentives and actors is necessary to understand what policies and programs works the best. New models and research in the fields of decision science, network theory, and consensus building could map the interplay of these diverse stakeholders at essential decision-making and policymaking junctures.

**Diffusion of Innovation:** Participants throughout the day identified a wide range of innovative practices, policies, and programs but wondered why and how some of these ideas gain traction. How do cities and local governments learn from each other? How do developers and others within the private sector learn about and eventually adopt the latest sustainability practices? What can government do to facilitate diffusion and policy transfer? Research across sectors on diffusion of innovation and the policy change process would help ensure that worthwhile experiments become main-stream.
Policy Integration and Programmatic Coordination: Another common theme across the three breakout groups involved ways to enhance and improve integration and coordination of sustainability policies and programs. Many of the comments focused on horizontal coordination across federal agencies (such as HUD, EPA, and DOT), as well as the special role that federal and state governments could play in vertical policy integration with regional and local governments. Research on policy integration and programmatic coordination seems especially critical given the myriad of federal and state plans within the purview of the interagency partners (e.g., consolidated plans, state and regional transportation plans). Moreover, the cross-disciplinary nature and multiple sectors involved in sustainability also warrant more research that could improve policy integration and programmatic coordination.

Sustainability Planning and Federal Grantees: About a quarter of the Roundtable’s academic participants were from departments in planning, urban affairs, or geography and yet only a few of the research ideas emphasized the pivotal role of planning. Sustainability touches all types of planning processes, such as transportation planning at the metropolitan and local scales, comprehensive land use plans, emerging sustainability policy plans and community or district energy plans. Research on these and other planning processes, the dissection of sustainability plans, and perhaps even the development of model planning templates at various scales (regional, city/county, and neighborhood) are especially timely and relevant in light of the sustainability planning grants recently issued by HUD and DOT. Tracking these new federal grantees as they design, adopt and implement their regional and local plans would be especially instructive for policy makers at all levels and would help to advance existing knowledge about sustainability planning.

Revamping Federal Research Programs

The following observations discuss how HUD and its partners might revamp their current approaches to research as a way to improve policy translation and build the foundation for a cohesive sustainable communities research agenda. Some of these comments were raised by roundtable participants while others are based on Virginia Tech’s overall assessment of managing this policy research process.

Longer Range Research Needs: Support for long-term systemic change requires a more deliberative and robust research agenda as comprehensive or complex policy changes may take a decade to take hold. For example, the development of complex modeling and metrics often requires multiple research projects that build upon previous work.

- HUD and its partners should consider organizing their individual or collective research agendas into different phases, especially those projects that support longer-term shifts in policy.
Immediate Research Needs: Compared with their academic counterparts, practitioners and policy makers often have more immediate research needs, such as evaluating the performance and effectiveness of existing programs. “Rapid response” research support on promising practices and pilot programs/projects could foster further innovation and prepare for more in-depth empirical evaluations.

- HUD and its partners should set aside grant funds for such applied research that delivers quick and credible results.
- Another option is to coordinate internal federal agency program evaluation offices to develop a priority list of critical research questions around the effectiveness of HUD, DOT, and EPA programs. Such policy evaluation research could help develop new benchmarks and performance measures for interagency collaboration and cooperation.

Participatory Policy/Community-Based Research and Demonstration Projects: Sustainability seems particularly ripe for models of participatory policy research. Many national policy organizations and community-based organizations have research experience, such as capturing baseline data on sustainability indicators and building community capacity. Academic researchers could benefit from building stronger partnerships with national and community-based policy organizations and professional associations involved with “on the ground” programs and projects.

- HUD and its partners could develop special programs and research grants that encourage or even require participatory research models on a wide range of sustainability activities and topics.
- Infuse participatory research elements within HUD’s sustainability planning and challenges grants. These demonstration projects are ideal living laboratories that could benefit from field research and other types of natural experiments.

Transdisciplinary Research: Sustainability also demands transdisciplinary conversations and investigations. Participants in the roundtable covered a wide range of fields, such as urban affairs, planning, economics, architecture, design, public policy, environmental studies, and law. While the process was designed to facilitate cross-disciplinary conversations, future sustainability research funding should build the foundation for transdisciplinary research. Compared with HUD, EPA and DOT have significantly greater research budgets that focus primarily in the fields of science, informatics, technology, and engineering.

- The three interagency partners (and other federal agencies, such as DOE, HHS, and USDA, as the partnership expands its reach) should explore ways to coordinate their research funding across agencies so the federal government could support more transdisciplinary examinations of sustainability.
- Future research grants on sustainable communities could also encourage or perhaps even require transdisciplinary analysis and project teams.
Collaborative Sustainability Research Networks: Collaborative approaches to sustainability research should also include more coordination among different research institutes in order to maximize strengths and capacity. HUD, EPA, and DOT already have university partnerships programs that allocate modest funds to support research centers at major universities.

- Develop a more cohesive and coordinated “sustainable communities” research agenda among current federal agency university centers. Examples of emerging research collaboration already exist, such as the What Works Collaborative that could serve as models.
- HUD could convene a dialogue with research-based foundations to support the development of joint federal agency and philanthropic research agendas on sustainable communities.
- Identify and create new “sustainability” research centers at institutions with extensive sustainability research expertise and outreach capacity and programs. HUD and its partners could also explore the development of a new sustainability university research network.

In conclusion, we believe the roundtable and this synthesis of recommendations offer HUD and its interagency partners a preliminary road map for crafting a research agenda on sustainable communities. We also recognize that researchers and practitioners must improve how they translate research into policy change and how policies could benefit from empirical investigations. More gatherings, similar to Virginia Tech’s September Roundtable will help strengthen these relationships and facilitate more meaningful policy and research translations.
APPENDICES
Appendix A: Background on the Roundtable Process

Virginia Tech, in consultation with HUD, sent invitations to academic and policy institutions with previous and current research and initiatives covering at least one of the three topic areas. Leading experts from national associations and advocacy organizations from the metropolitan Washington, D.C. area were also invited. More than 50 leading practitioners and researchers participated in the September Roundtable covering different disciplines and multiple fields. 1 Raphael Bostic, Assistant Secretary for Policy Development and Research, and Maria Zimmerman, Deputy Director of the Office of Sustainable Housing and Communities, along with 20 staff from the Partnership for Sustainable Communities (HUD, EPA, and DOT), engaged in the discussions throughout the day.

The roundtable was organized into breakout groups for each of the three topic areas along with two plenary sessions at the beginning and end of the day. 2 Leading faculty from Virginia Tech’s Urban Affairs and Planning Department developed research and policy briefing papers covering the roundtable’s three topic areas. 3 The primary task for each breakout group was to review, refine, expand, and eventually prioritize the research issues and questions.

The breakout discussion was part focus group—reacting to the draft categories and research issues discussed in the briefing papers—and part brainstorming to gather input and ideas. The discussion was followed by prioritizing the list of research issues and questions. The key aim for all breakout groups was to help identify the top research priorities that would support HUD’s Partnership for Sustainable Communities and the Office of Policy Development and Research as they develop and implement policies and programs that promote more sustainable communities. Each breakout session had an experienced lead facilitator, two content/expert facilitators, and a graduate student note-taker.

In the weeks after the workshop, Metropolitan Institute staff compiled the raw notes and drafted summaries from each breakout group. 4 Each summary captures the key themes discussed, along with suggested research areas/questions and recommendations for research priorities. These summary documents were posted on Virginia Tech’s Scholar webpage and all workshop group attendees and invitees were invited to comment on the summary documents or provide further feedback or recommendations via e-mail or phone. Virginia Tech did consider these and other suggestions and made relevant revisions within this report.

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1 For a complete list of attendees, see the Metropolitan Institute web page at www.mi.vt.edu.
2 For the agenda of the day, see the Metropolitan Institute web page.
3 Each of the breakout overview papers can be found on the Metropolitan Institute web page.
4 For copies of these breakout group synopses, please see the Metropolitan Institute web page.
## Appendix B: Accessible and Affordable Housing Research Matrix

<table>
<thead>
<tr>
<th>Research Topic &amp; Policy Area</th>
<th>Subcategories</th>
<th>Research Ideas &amp; Questions</th>
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<tbody>
<tr>
<td>Agent Decision-Making</td>
<td>Economic/Market</td>
<td>How do households, employers, and developers make investment and location decisions?</td>
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<td>What are the incentives for developers to meet the &quot;latent&quot; demand for sustainable development patterns?</td>
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<td>What policy incentives/constraints allow socially responsible investors and developers to achieve their social objectives? What are those objectives? How does one identify/target socially responsible investors?</td>
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<td>How do transportation policies (especially those created by transportation engineers) influence developers’ investment/location decisions?</td>
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<td>Land-Use Policy &amp; Infrastructure</td>
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<td>What factors, such as land-use policy changes, impact local and state government’s transportation investments?</td>
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<td>How do transportation costs affect proximity to employment? What other factors impact the relationship of transportation and employment?</td>
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<td>How do historic development patterns (e.g. suburban development) constrain future transportation investment options by local and state governments?</td>
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<td>What is the impact of compact development (or land-use patterns more generally) on number and distance of non-work trips?</td>
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<td>How do local land use regulations interact with level of service (LOS) to shape individual decisions about travel?</td>
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<td>How does quality of active transportation facilities in the workplace and residential housing influence trip behavior? Examples: showers, bike parking, lockers, regulations for workplaces and multifamily units.</td>
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<td>Does city-wide bike and walking infrastructure influence mode share and transportation costs? Is there a relationship to housing costs?</td>
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<td>How does accessibility to public transit influence household and firm location choices?</td>
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<td>Individual/Societal-level factors</td>
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<td>How does consumer-based education and marketing (e.g. about transportation options, sustainability, etc) influence housing and transportation costs?</td>
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<td>Do culture and ethnicity impact housing and transport preferences?</td>
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<td>How do housing and transportation needs or preferences vary by gender?</td>
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<td>How do social media communication tools impact transportation choices? What is these tools’ target demographic?</td>
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<td>How do current housing and transportation policies affect the design and development of housing stock and neighborhoods that make it easier for older residents to “age in place?” What factors facilitate aging in place?</td>
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<td>Policy &amp; Program Evaluation/Coordination</td>
<td>Policy Analysis</td>
<td>How does residing or working in mixed-use housing and/or employment centers (as compared to single-use centers) impact transportation costs?</td>
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<td>What financial tools or regulatory incentives facilitate accessible and affordable housing?</td>
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<td>What is the relationship between accessibility to public transit and housing affordability, over time?</td>
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<td>What factors facilitate or create barriers to introducing new development patterns (e.g. urbanizing a suburban area)?</td>
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<td>What is the impact of compact development (or land use patterns, more generally) on quality/cost of public services?</td>
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<td>What policy factors impact the sustainability (maintenance) of existing affordable housing stock, displacement, and gentrification? What is the impact of design?</td>
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<td>How do structural changes in the U.S. economy (such as slow economic recovery, high and long-term unemployment, increased foreclosure rates, lower home values, lower discretionary spending, and the “new” homelessness) shape affordable housing and transportation policies?</td>
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<td>What is the impact of a disciplinary vs. transdisciplinary approach to transportation on transportation policy and investment decisions?</td>
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<td>What is the effect of urban land-use management and transportation coordination on affordable housing?</td>
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<td>How can the public sector recapture the value of public sector investments that is capitalized into land prices?</td>
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<td>What sort of legislative models can be developed and tested that permit large-scale access to urban land without direct government intervention (i.e. eminent domain)?</td>
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<td>Case Studies/Program Evaluation</td>
<td>Conduct a meta-analysis of TOD best practices and case studies.</td>
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<td>What are international best practices with respect to TOD, density bonuses, BRT, value capture, etc?</td>
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<td>Evaluate existing federal and state housing programs (e.g. HOPE VI, HOME, etc.) with an emphasis on understanding individual decision-making.</td>
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<td>Examine and compare how different regions, with different regulatory and governance structures, perform according to a standard set of livability metrics.</td>
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<td>How do we devise livability metrics for evaluating different types of sustainable housing and transportation policies and programs (including costs for economic, quality of life for social and environmental benefits)?</td>
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<td>What are best practices, including strategies and techniques (charrettes, key pad voting, etc.) in community engagement within the field of sustainability and climate action planning?</td>
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<td>Policy and Planning Coordination</td>
<td>How to develop better plan-making and decision support systems (information, mapping, scenario planning, etc.) that allow policy makers and the public to better understand and envision the interaction among land use, transportation, housing, economic development, and the environment?</td>
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<td>What are best practices in coordinating MPO transportation plans and local comprehensive plans?</td>
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<td>Policy &amp; Program Evaluation/Coordination</td>
<td>Methods, Models, and Evaluation Tools</td>
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<td>How does residing or working in mixed-use housing and/or employment centers (as compared to single-use centers) impact transportation costs?</td>
<td>Conduct a cost/benefit analysis of employee commute times and for different kinds of businesses.</td>
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<tr>
<td>What financial tools or regulatory incentives facilitate accessible and affordable housing?</td>
<td>How to develop a decision-making tool to help employers understand the implications of different location decisions?</td>
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<tr>
<td>What is the relationship between accessibility to public transit and housing affordability, over time?</td>
<td>What is the usefulness of simulation games for transportation and understanding decision-making?</td>
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<tr>
<td>What factors facilitate or create barriers to introducing new development patterns (e.g. urbanizing a suburban area)?</td>
<td>What factors influence/improve the diffusion of information and innovation (public sector and industry/business practices)?</td>
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<tr>
<td>What is the impact of compact development (or land use patterns, more generally) on quality/cost of public services?</td>
<td>How do decision makers/policymakers use information on innovative practices and policies in making decisions related to housing—transportation linkages? What is the role of marketing?</td>
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<tr>
<td>What policy factors impact the sustainability (maintenance) of existing affordable housing stock, displacement, and gentrification? What is the impact of design?</td>
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<tr>
<td>How do structural changes in the U.S. economy (such as slow economic recovery, high and long-term unemployment, increased foreclosure rates, lower home values, lower discretionary spending, and the “new” homelessness) shape affordable housing and transportation policies?</td>
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<tr>
<td>What is the impact of a disciplinary vs. transdisciplinary approach to transportation on transportation policy and investment decisions?</td>
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<td>What is the effect of urban land-use management and transportation coordination on affordable housing?</td>
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<tr>
<td>How can the public sector recapture the value of public sector investments that is capitalized into land prices?</td>
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<tr>
<td>What sort of legislative models can be developed and tested that permit large-scale access to urban land without direct government intervention (i.e. eminent domain)?</td>
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<tr>
<td>Case Studies/Program Evaluation</td>
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<tr>
<td>Conduct a meta-analysis of TOD best practices and case studies.</td>
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<tr>
<td>What are international best practices with respect to TOD, density bonuses, BRT, value capture, etc?</td>
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<tr>
<td>Evaluate existing federal and state housing programs (e.g. HOPE VI, HOME, etc.) with an emphasis on understanding individual decision-making.</td>
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<td>Examine and compare how different regions, with different regulatory and governance structures, perform according to a standard set of livability metrics.</td>
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<tr>
<td>How do we devise livability metrics for evaluating different types of sustainable housing and transportation policies and programs (including costs for economic, quality of life for social and environmental benefits?)</td>
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<td>What are best practices, including strategies and techniques (charrettes, key pad voting, etc.) in community engagement within the field of sustainability and climate action planning?</td>
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<tr>
<td>Research Topic</td>
<td>Subcategories</td>
<td>Research Ideas and Questions</td>
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<tr>
<td>Residential Energy Efficiency and Conservation Practice and Evaluation</td>
<td>Energy and cost-effectiveness performance of residential energy retrofit/renovation technologies and practices by building characteristics (e.g., regional location, type, age, MF/SF, renter/owner). What technologies and practices are most effective in different contexts?</td>
<td>Meta-Analysis of evaluations of weatherization and utility retrofit programs. What do the decades of experience in these programs tell us about technology, practice, and implementation?</td>
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<tr>
<td>Meta-Analysis</td>
<td>Meta-analysis of evaluations of new affordable housing construction by HUD PATH, DOE Building America, and other programs. What does the experience from these programs tell us about affordable technology, design, and practice?</td>
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<tr>
<td>Capitalization and Finance</td>
<td>Environmental, health, and other related performance of residential energy retrofit/renovation technologies and practices. What other non-energy benefits and impacts result from energy efficient technologies and design?</td>
<td>The impact of occupant behavior in affordable comfort and energy efficiency. How do behavioral interventions (e.g., education, real-time metering display) affect energy savings? To what extent does the “rebound effect” impact energy savings of affordable housing retrofits?</td>
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<tr>
<td>Mortgages and Finance</td>
<td>The interaction between/among technology innovation, green rating systems (e.g., LEED, HERS, Energy Star, Home Energy Score), building codes/standards, and affordable housing markets. How do new energy technologies affect codes and market penetration? How do rating systems affect new building and retrofit practices and codes? How can codes and standards affect both new and retrofit markets?</td>
<td>The interaction between/among technology innovation, green rating systems (e.g., LEED, HERS, Energy Star, Home Energy Score), building codes/standards, and affordable housing markets. How do new energy technologies affect codes and market penetration? How do rating systems affect new building and retrofit practices and codes? How can codes and standards affect both new and retrofit markets?</td>
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<tr>
<td>Mortgage products and equity investments</td>
<td>What is the state of the capital markets in relation to green housing (single-family and multi-family) products?</td>
<td>Selection of mortgage products with green features: who is currently using these mortgage products; what is the potential scale of the market and what is needed to maximize market size?</td>
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<td>Location and Energy Efficient Mortgages</td>
<td>What is their current market penetration of energy efficient mortgages; what impediments exist to increased diffusion; and how to maximize market share?</td>
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<td>What is the current state of the RMBS market and pricing of green-housing securities and derivatives? Are there alternative methods of financing via secondary markets?</td>
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<tr>
<td>Risk Assessment</td>
<td>Do buyers of energy efficient homes have lower default risk?</td>
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<td></td>
<td>Do low/moderate mortgagees under weatherization energy program have higher/lower probability or incidence of default?</td>
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<td>If the risk of default is potentially lower in green, affordable housing, how can this help lower the cost of capital to the borrower?</td>
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<td>Appraisal and Valuation Methodologies</td>
<td>How can energy efficiency be woven into appraisal methodology and valuation? How are green rating systems reflected in appraisal, valuation, and mortgage ratings?</td>
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<td>How can energy efficiency be captured in marketing through MLS and similar brokerage services?</td>
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<td>To what extent are green features capitalized for lower rent multi-family units/buildings? Does green performance (e.g. energy and water usage) influence the cap rate?</td>
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<td>What is the relationship between invested capital and appraised price as related to green technologies/instruments? How are market and non-market (social benefits) benefits capitalized? What internal and external benefits are captured in market pricing?</td>
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<tr>
<td>Accrual of Benefits</td>
<td>To whom do investments in energy efficiency agglomerate and how do agglomeration patterns influence investment or adoption decisions?</td>
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<td>Can the extra value agglomerated by utility savings be captured to provide an incentive for investment? How can these savings be distributed? What information on accrual of benefits is lacking or distributed asymmetrically?</td>
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## Subsidies and Energy Efficiency

What is the state of knowledge relating to agency-based subsidies? What is the state of technical knowledge on component and systems efficiency thresholds? What components/systems have the greatest current or near-term potential? What impediments or reductions in impact occur during installation and operation?

### Incentive Structure, Interaction, and Valuation

- To what extent does the current subsidy structure provide incentives or disincentives for green consumption behavior?
- How do various government subsidies interact to affect behavior of tenants? How do utilities (as bundled or unbundled) affect affordability, tenant income, etc?
- Do the full benefits of subsidies accrue to tenants, managers, or investors? How do we adjust the subsidy system to create desired results?
- What is the actual value of subsidizing green housing for eligible consumers? What is the market value of the subsidy?
- How should housing subsidies be structured to incentivize energy conservation?
- How do green building incentives affect housing affordability (relative to income or tenant occupancy duration)? Differential impacts of eligible communities?

### Information and Decision Making

- How do property conditions and ownership characteristics (age, quality, etc. of housing stock) impact energy savings of efficiency interventions and thus the effectiveness of incentives designed to promote energy-efficiency?
- What is the “information” elasticity of demand? e.g., what has been the impact of performance and life-cycle information on the market penetration of compact fluorescent bulbs?
- What is the income elasticity of utility price changes?
- How might improved information on actual utility prices influence household energy usage?
- How to prioritize spending—by setting targets or setting subsidies—which comes first/which is a priority? Small marginal investment in some units or deep investments in other units? How to reconcile non-linear relationships to create public benefit? How do we use this to develop evidence-based policy?

## Commercialization and Diffusion

What public interventions are cost effective in accelerating innovation, commercialization, and adoption?

### Cycle of Innovation and Commercialization

- What is the typical trajectory of product commercialization and innovation in building systems, technologies, materials, concepts, etc?
- Can innovation and commercialization cycles for green housing be accelerated? What would be the key points for intervention?

### Cycles of Adoption and Diffusion

- What is the distribution of green-housing technology adopters across adoption typologies (both commercial and individual adopters)
- Can diffusion cycles be accelerated through public intervention in the early phase of diffusion? What are the relative impacts and costs of regulatory interventions, producer or consumer subsidies, and demonstration programs?
<table>
<thead>
<tr>
<th>Government Program Efficacy</th>
<th>What are the most effective administrative and management approaches for increasing agency efficacy? What principal-agent approaches produce the best results?</th>
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<tr>
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<td>What are Best Management Practices for creating green housing through regulatory or subsidy interventions?</td>
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<td>How have agency grantees innovated with funds? What can HUD learn from other agency experiences? What are the approaches for identifying, capturing and distributing best management practices from field agencies in maximizing effectiveness?</td>
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<td>What are Best Management Practices for greening the housing inventory that is publicly owned, operated or funded? GSA and other public owner-operators with green assets; Leasing Strategies and Terms; Acquisition/Development/Operation strategies</td>
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<tr>
<td>Optimal Grouping of Policies and Structure</td>
<td>What is the optimal distribution of policies that best engages housing stock? History of policy interactions to predict obstacles for creating green and affordable housing. Policy combination: Does partitioning policies promote efficiency?</td>
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Appendix D: Cities in Transition Research Matrix

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<tr>
<th>Research Topic and Policy Area</th>
<th>Research Ideas &amp; Questions</th>
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<tr>
<td><strong>Federal and State Policy Level</strong></td>
<td>Given that CiTs are creatures of the state, how could the federal government award/condition grants that encourage/require states to reform local government structures and systems that would facilitate regeneration of CiT? (Ex: condition HUD funding, such as NSP, to states and local governments in exchange for reforming tax foreclosure processes or enacting state authorizing legislation for land banking to expedite the reclamation of vacant properties?)</td>
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<td>What kind of policies could help create new regional public authorities that would allocate federal and state regeneration resources throughout a region (in a way which establishes stronger political or economic connections between the central city and the other local governments—suburbs, towns, villages—in the rest of the region)? (Ex: revenue sharing models among municipalities?)</td>
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<td>What can practitioners and policymakers learn from experiences of the national, state, and regional governments from other industrialized nations that have had similar experiences of chronic distress and decline? (Ex: comparative fiscal structure of local governments (Germany has good models); lessons from the right sizing/reconfiguration of Leipzig; the economic rejuvenation of Torino; the social regeneration of Manchester, etc.)</td>
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<td>What is the legal authority and conditions for state governments to place local governments into receivership? Do state governments have the capacity? Who are the receivers? How long? What is the track record of municipal receivership? Which ones were successful, which ones were not, and why? What is the measure of success?</td>
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<td>How do we design comprehensive policy strategies that empower people and communities as well as the regeneration of the physical environment (e.g., must take into account issues such as poverty, race, cultural and historical preservation, etc.)?</td>
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<td>How can federal government programs that address education, health, and social welfare inform policies involving housing, community development, and sustainability? Can we adapt aspects of urban regeneration policy from the UK that integrates revitalization of the physical environment with social environment?</td>
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</table>
| Metropolitan/ Regional Policy | How do we design/develop a “place-based” approach to the regeneration of CiT? What is the appropriate scale of intervention—regional, city-wide, community, and neighborhood?  

Within a region what are the conditions/drivers and special challenges confronting smaller, older industrial cities? How might these conditions influence state or regional policy response? For example, how do the local governments with limited capacity facilitate the necessary transformation?  

In looking at the impact and influence of regional job markets to stabilize CiT, how do we connect people who live in central cities to employment opportunities throughout the region?  

What are the socioeconomic/demographic characteristics/conditions of regions whose core city residents have been given better access to employment opportunities through the region?  

What are the different models of regional governance and how do they work now and how could new models of regional governance facilitate transformation of CiT? How do these models differ across geography, scale, legal authority, budget, programmatic scope, etc.?  

How do we devise regional or metropolitan planning approaches (e.g., Smart Growth strategies and tools, comprehensive plans, urban growth boundaries, reverse impact fees, etc.) that would make it more difficult to develop in greenfields and encourage more infill development in the urban core and first tier suburban communities (that are often in some level of distress)? |
| **Local/Community Policy Level**  
(With special emphasis on local govt. fiscal capacity and infrastructure) | How can municipal services and infrastructure be redesigned/restructured in areas of shrinking cities that are abandoned? What are the legal, social, and policy implications? Would this have any positive impact on the city’s fiscal condition—what are the short and long term costs and benefits of decommissioning infrastructure or decreasing public services?  

For cities/communities in weak economic markets (jobs, housing, etc.) how do various public and private sector actors make economic/market decisions to invest or disinvest?  

What economic development policies could be devised to facilitate investment and discourage disinvestment? What are the economic drivers (positive and negative) within weak markets?  

What are the costs/benefits of different economic development policy interventions in CiT?  

With respect to land development and building, how do developers make investment decisions within weak economic regions and how do local governments make decisions of triage?  

What is an effective citywide vision and strategic action plan that has one set of policies for reclaiming abandoned neighborhoods in one part of the city and another set of strategies for protecting and preserving relatively stable neighborhoods in another part of the city?  

How can a citywide vision or comprehensive plan facilitate sustainable reuse of vacant land, Brownfields, and abandoned properties within CiT, such as urban agriculture, community-based renewable energy, etc.? |
| --- | --- |
| **Neighborhood Scale Condition & Policy Interventions**  
(Different place-base strategies for acutely distressed places vs. chronically distressed places) | What is happening in the diverse types of land development and real estate markets within weak market cities? Who is buying property (speculators?) and who owns property in distressed real estate markets?  

How do these trends in land development and real estate market influence local government policies to reconfigure neighborhoods and revitalize distressed communities?  

In targeting certain severely distressed neighborhoods, how do you measure the effectiveness of the policy intervention (focus on neighborhood scale)? How do you agree on your measures and how do you define success?  

What is the appropriate type/format for effective neighborhood level planning in severely distressed neighborhoods that engages the residents in meaningful dialogue about the future of their neighborhoods?  

What are effective approaches/techniques for engaging remaining residents, often low-income, minority communities, in the decision-making about whether and how to justly reconfigure their neighborhood?  

How effective are various vacant property/vacant land management policies, such as land banking, community land trusts, in gaining control over vacant/abandoned buildings and land, managing vacant properties, and then facilitating productive reuse? |