

West Chester University Digital Commons @ West Chester University

Sustainability Research & Creative Activities
Seminar Presentations

Sustainability Research & Creative Activities @
WCU

2-13-2019

Zoning for Climate Change: Learning from Leader Suburbs

Dorothy Ives Dewey

West Chester University of Pennsylvania, divesdewey@wcupa.edu

Follow this and additional works at: https://digitalcommons.wcupa.edu/src_a_sp

 Part of the [Urban Studies and Planning Commons](#)

Recommended Citation

Ives Dewey, D. (2019). Zoning for Climate Change: Learning from Leader Suburbs. Retrieved from https://digitalcommons.wcupa.edu/src_a_sp/2

This Seminar Presentation is brought to you for free and open access by the Sustainability Research & Creative Activities @ WCU at Digital Commons @ West Chester University. It has been accepted for inclusion in Sustainability Research & Creative Activities Seminar Presentations by an authorized administrator of Digital Commons @ West Chester University. For more information, please contact wccressler@wcupa.edu.

Planning, Law and Property Rights
(PLPR) Annual Meeting 2019 in
Houston, TX



Zoning for Climate Change: Learning from Leader Suburbs

Dorothy Ives Dewey, Ph.D., AICP
Professor of Planning
Chair, Geography & Planning
Department
West Chester University
West Chester, Pennsylvania USA

"To plan is human: to implement, divine."

▫ Jerold Kayden

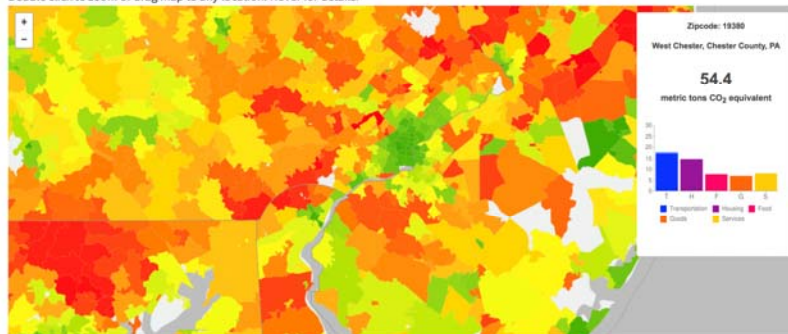
Research Overview

- How are local *suburban* communities using the planning and the regulatory process to prepare for climate change?
- Exploratory investigation of suburban differentiation and its impact on sustainable land use practices and effective climate action regulatory strategies
- Better understand how *zoning* can be used to in a suburban context to implement climate planning initiatives of local governments

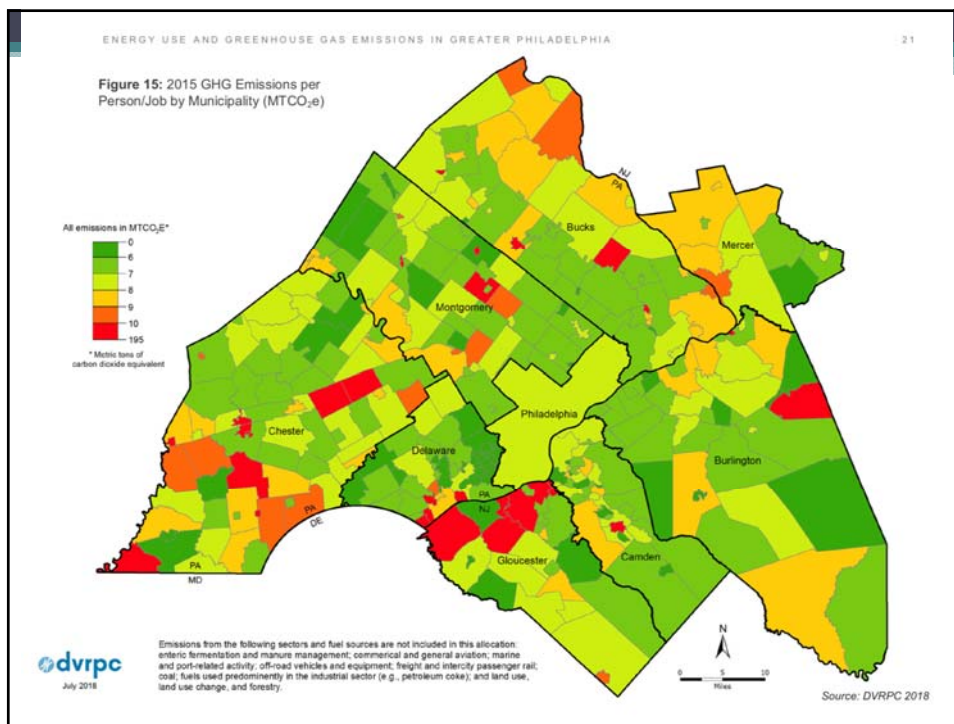
Why important?

Average Annual Household Carbon Footprint by Zip Code

Double click to zoom or drag map to any location. Hover for details.



- ❖ 51% of the population in the U.S. lives in the suburbs (*Brookings Institute, 2011*)
- ❖ Diversifying and aging rapidly
- ❖ Suburban municipalities have most control over land use and building regulation
 - ❖ Impacts transportation patterns and activities
- ❖ A considerable part of the global warming challenge can be met through the design and development of suburbs



Starting Point for the Research

Suburbs are varied entities, and a wide range of climatic changes will occur in them (extreme, gradual)

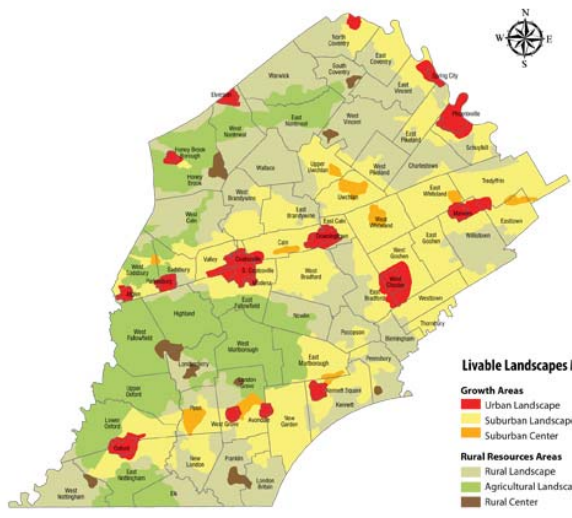
These changes will have variable impacts on people and the physical environment

A number of changes could be made to the physical environment to make suburbs more climate friendly, liveable and resilient

Climate mitigation and adaptation strategies and regulations need to be effective and feasible and consistent with other suburban planning objectives and agendas




Seeking to determine how local regulatory strategies, particularly zoning, align with with differing characteristics of suburban types

Chester County, Pennsylvania



- Range of Suburban Forms:
- Stressed
 - Job Centers
 - Mature Bedroom Communities
 - Developing Bedroom Communities
 - Exurban

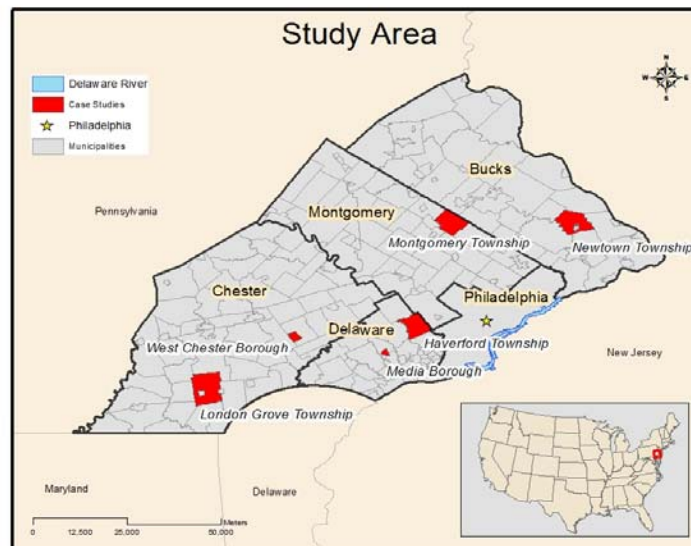


Type of suburb	Characteristics	Image
Stressed	<i>Pre-WWII; first ring suburbs; industrial cities; aging infrastructure; poverty; social instability</i>	
Job Center	<i>High Density: Town Centers and Edge Cities; Urban qualities; served by rail; diversity in housing stock; diverse populations</i>	
Mature Bedroom	<i>Mature car suburb; post-WWII 1950's-1970's; located along major road corridors; medium density, mostly single-family detached housing;; higher density commercial centers and corridors</i>	
Developing Bedroom	<i>Low density; residential, mid 1990s – present day; located in urban fringe; automobile dependent; rapid land conversion; low density, mostly single-family detached dwellings on large lots.</i>	
Exurban	<i>Emerging, agricultural</i>	

Research Methodology

- Part 1: Identification of *leader suburbs* for a set of case studies
- Part 2: Identification of *zoning actions* for climate planning
- Part 3: Review of local planning and zoning ordinances

Part 1: Identify Leader Suburbs

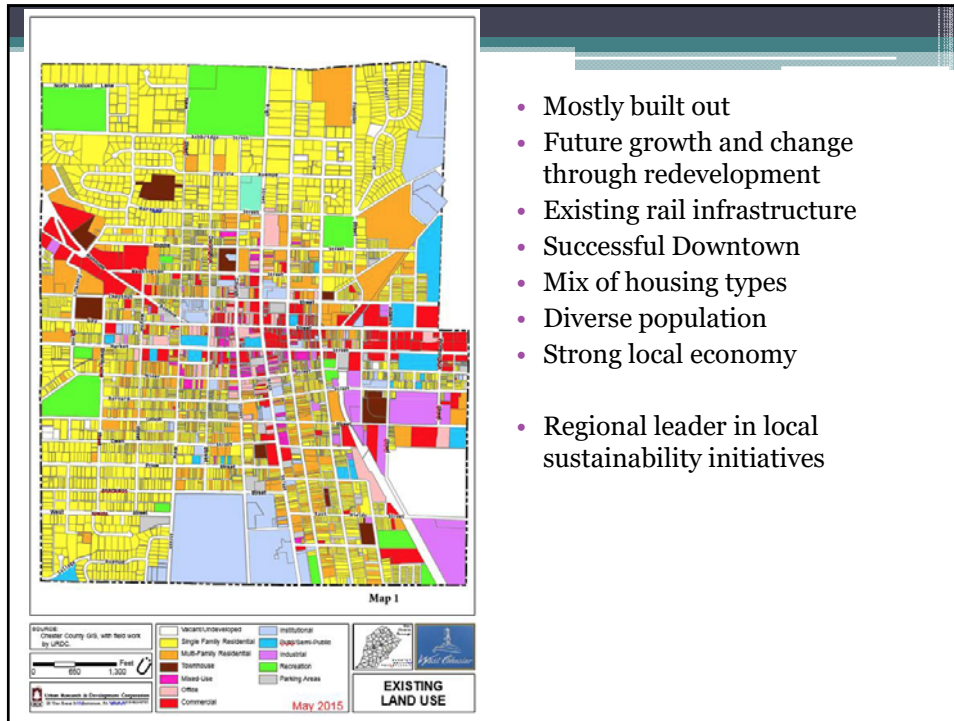


PART 2		Master List of Zoning Tools for Climate Planning
Sequestration	Urban Forestry Tree Canopy Protection Woodland and Forest Protection Open space protection Natural resources protection Cluster development/conservation subdivision	
Sustainable Land Use	Infill Development Mixed use development Enhance Walkability Enhance Bikeability Transfer of Development Rights Transit-oriented Development Live/Work Units LEED-ND Planned Unit Development Revised parking standards	
Energy Efficiency	Solar Access Protection Wind Turbines Carbon neutral requirements Green Building Standards	
Adaptation	Green infrastructure Stormwater Management Local Food/Community Gardens Urban agriculture/farming Agricultural Protection Floodplain Protection	

Part 3: Review of Local Planning and Zoning Case Study - West Chester Borough

- *A Job Center*
- Population (2010) : 18,461 up 3.4% since 2000
- Total Area: 1.8 sq. miles
- Population density: 16 per acre
- Median Household Income: \$45,071 (\$86,050 Chester County)
- Ethnicity: 72% White, non-Hispanic; 13.4% Hispanic; 12.1% African American

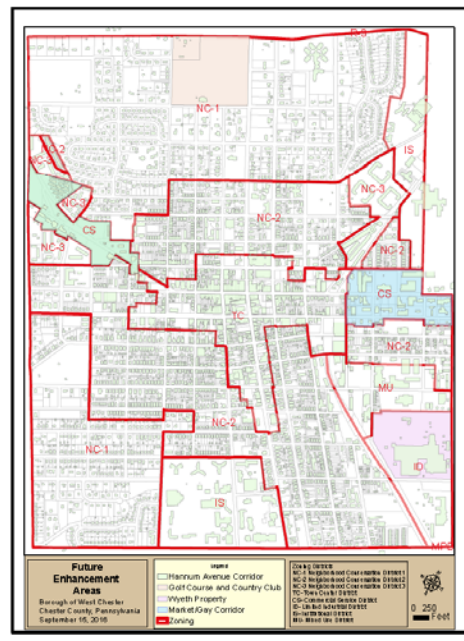




- Mostly built out
 - Future growth and change through redevelopment
 - Existing rail infrastructure
 - Successful Downtown
 - Mix of housing types
 - Diverse population
 - Strong local economy
-
- Regional leader in local sustainability initiatives

Climate Planning Strategies:

- Encourage more walkability and bikability
- Encourage more mixed use development
- Develop appropriate infill standards
- TDR to protect few remaining open spaces
- Protect the urban tree canopy
- Transit oriented development
- Incentivize energy conservation strategies

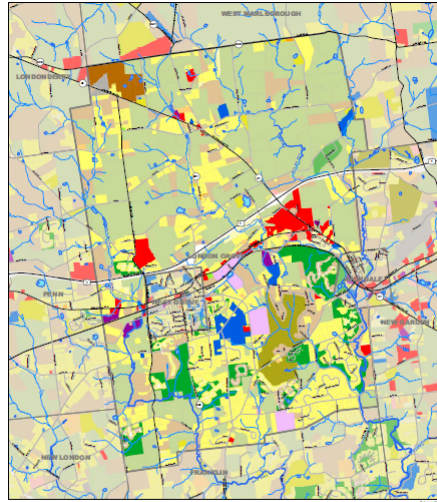


	Zoning Items
Sequestration	Urban Tree Canopy Requirements Woodlands Preservation Open Space Preservation Natural Resources Preservation
Sustainable Land Use	Infill Development Mixed Use Development Enhance Walkability Live/Work Units
Energy Efficiency	Green building incentives
Adaptation	Floodplain Protection Stormwater Management

Part 3: Review of Local Planning and Zoning Case Study - London Grove Township

- A *Developing Bedroom* suburb
- Population (2010) : 7,475 up 41% since 2000
- Total Area: 17 sq. miles
- Population density: 0.75 per acre
- Median Household Income: \$74, 337 (\$86,050 Chester County)
- Ethnicity: 84% White, non-Hispanic; 13.2% Hispanic; 2.4% African American





London Grove Township Comprehensive Plan
EXISTING LAND USE
Figure 2.2.1

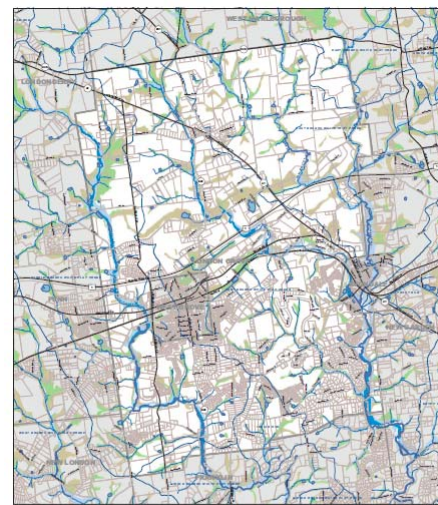
“Preserving our rural heritage while embracing our new community”

Historically agricultural
 Primarily mushroom farming
 Rapid growth has challenged agricultural character
 Most residents commute to jobs
 40% agricultural
 26% residential, primarily sfd
 2% commercial
 12% woodlands & other natural resources

23% of land converted to residential uses over a 12-year period

Climate Planning strategies

- Stormwater management became a critical issue with rapid development
 - Flooding more frequent, serious and damaging
- Preserving natural resources and open space
- Local business development
- Protecting Cultural Landscape
- Establish a local identity



London Grove Township Comprehensive Plan
HYDROLOGY
Figure 2.4.2

	Zoning Items
Sequestration	Protect Tree Canopy Woodland Preservation Open Space Protection Natural Resources Protection Cluster Development
Sustainable Land Use	Mixed Use development TDR Planned Unit Development
Energy Efficiency	Solar Access Protection Wind Turbine Standards
Adaptation	Stormwater Management Agricultural Protection Floodplain protection

Summary of 12 Case Studies

	Stressed	Developed Job Center	Developing Job Center	Bedroom Suburb
Sequestration		Urban Tree Canopy Cluster Development	Woodland Protection Natural Resource Protection Cluster development	Woodland Protection Natural Resource Protection Open Space Protection Cluster Development
Sustainable Land Use	TOD Mixed Use Devt Infill Development	TOD TDR Mixed Use Devt Infill Development Walkability Bikeability	TOD Mixed Use Devt Walkability Bikeability	TDR Mixed Use Devt Planned Unit Devt
Energy Efficiency		Green Building Incentives	Green Building Incentives	
Adaptation	Stormwater Management Floodplain protection	Stormwater Management Floodplain protection	Stormwater Management Floodplain protection	Stormwater Management Floodplain protection

CLIMATE POLICY	ZONING TOOL	SUMMARY	Stressed	Job Center	Mature Bedrpn.	Dev Bedrpn.
SEQUESTRATION	Protect Tree Canopy	92.0%	66.7%	100.0%	100.0%	100.0%
	Urban Forestry	8.3%	0.0%	33.3%	10.0%	0.0%
	Forest Woodlands Pres	50.0%	0.0%	33.3%	0.0%	100.0%
	Open Space Preservation	91.6%	66.7%	100.0%	66.7%	100.0%
	Nat Resources Protection	75.0%	33.3%	66.7%	100.0%	100.0%
	Cluster/Conservation Sub	58.3%	0.0%	33.3%	100.0%	100.0%
SUSTAINABLE LAND PLANNING	Infill Development	41.6%	66.7%	66.7%	0.0%	33.3%
	Mixed-Use Devt.	100.0%	100.0%	100.0%	100.0%	100.0%
	Enhancing Walkability	75.0%	66.7%	100.0%	100.0%	33.3%
	Enhancing Bikeability	33.3%	33.3%	33.3%	66.7%	0.0%
	TDR	16.6%	0.0%	0.0%	0.0%	66.7%
	TOD	25.0%	33.3%	66.7%	33.3%	0.0%
	Live/Work Units	33.3%	33.3%	66.7%	0.0%	33.3%
	LEED-ND	8.3%	0.0%	0.0%	33.3%	0.0%
	PUD	25.0%	0.0%	0.0%	33.3%	66.7%
	Reduced Parking Stds	50.0%	66.7%	66.7%	0.0%	66.7%
ENERGY EFFICIENCY	Solar Access Protection	58.3%	66.7%	0.0%	33.3%	100.0%
	Wind Turbines	33.3%	33.3%	0.0%	0.0%	100.0%
	Carbon Neutral Repts.	0.0%	0.0%	0.0%	0.0%	0.0%
	Green Building	25.0%	33.3%	33.3%	33.3%	0.0%
ADAPTATION	Green Infrastructure	0.0%	0.0%	0.0%	0.0%	0.0%
	SWM	100.0%	100.0%	100.0%	100.0%	100.0%
	Community Gardens	0.0%	0.0%	0.0%	0.0%	0.0%
	Urban Farming	0.0%	0.0%	0.0%	0.0%	0.0%
	Agricultural Protection	50.0%	33.3%	0.0%	33.3%	100.0%
	Floodplain Protection	100.0%	100.0%	100.0%	100.0%	100.0%

CLIMATE POLICY	ZONING TOOL	SUMMARY	Stressed	Job Center	Mature Bedrpn.	Dev Bedrpn.
SEQUESTRATION	Protect Tree Canopy	92.0%	66.7%	100.0%	100.0%	100.0%
	Urban Forestry	8.3%	0.0%	33.3%	10.0%	0.0%
	Forest Woodlands Pres	50.0%	0.0%	33.3%	0.0%	100.0%
	Open Space Preservation	91.6%	66.7%	100.0%	66.7%	100.0%
	Nat Resources Protection	75.0%	33.3%	66.7%	100.0%	100.0%
	Cluster/Conservation Sub	58.3%	0.0%	33.3%	100.0%	100.0%
SUSTAINABLE LAND PLANNING	Infill Development	41.6%	66.7%	66.7%	0.0%	33.3%
	Mixed-Use Devt.	100.0%	100.0%	100.0%	100.0%	100.0%
	Enhancing Walkability	75.0%	66.7%	100.0%	100.0%	33.3%
	Enhancing Bikeability	33.3%	33.3%	33.3%	66.7%	0.0%
	TDR	16.6%	0.0%	0.0%	0.0%	66.7%
	TOD	25.0%	33.3%	66.7%	33.3%	0.0%
	Live/Work Units	33.3%	33.3%	66.7%	0.0%	33.3%
	LEED-ND	8.3%	0.0%	0.0%	33.3%	0.0%
	PUD	25.0%	0.0%	0.0%	33.3%	66.7%
	Reduced Parking Stds	50.0%	66.7%	66.7%	0.0%	66.7%
ENERGY EFFICIENCY	Solar Access Protection	58.3%	66.7%	0.0%	33.3%	100.0%
	Wind Turbines	33.3%	33.3%	0.0%	0.0%	100.0%
	Carbon Neutral Repts.	0.0%	0.0%	0.0%	0.0%	0.0%
	Green Building	25.0%	33.3%	33.3%	33.3%	0.0%
ADAPTATION	Green Infrastructure	0.0%	0.0%	0.0%	0.0%	0.0%
	SWM	100.0%	100.0%	100.0%	100.0%	100.0%
	Community Gardens	0.0%	0.0%	0.0%	0.0%	0.0%
	Urban Farming	0.0%	0.0%	0.0%	0.0%	0.0%
	Agricultural Protection	50.0%	33.3%	0.0%	33.3%	100.0%
	Floodplain Protection	100.0%	100.0%	100.0%	100.0%	100.0%

CLIMATE POLICY	ZONING TOOL	SUMMARY	Stressed	Job Center	Mature Bedrqn.	Dev Bedrqn.
SEQUESTRATION	Protect Tree Canopy	92.0%	66.7%	100.0%	100.0%	100.0%
	Urban Forestry	8.3%	0.0%	33.3%	0.0%	0.0%
	Forest Woodlands Pres	50.0%	0.0%	33.3%	0.0%	100.0%
	Open Space Preservation	91.6%	66.7%	100.0%	66.7%	100.0%
	Nat Resources Protection	75.0%	33.3%	66.7%	100.0%	100.0%
	Cluster/Conservation Sub	58.3%	0.0%	33.3%	100.0%	100.0%
SUSTAINABLE						
LAND PLANNING	Infill Development	41.6%	66.7%	66.7%	0.0%	33.3%
	Mixed-Use Devt.	100.0%	100.0%	100.0%	100.0%	100.0%
	Enhancing Walkability	75.0%	66.7%	100.0%	100.0%	33.3%
	Enhancing Bikeability	33.3%	33.3%	33.3%	66.7%	0.0%
	TDR	16.6%	0.0%	0.0%	0.0%	66.7%
	TOD	25.0%	33.3%	66.7%	33.3%	0.0%
	Live/Work Units	33.3%	33.3%	66.7%	0.0%	33.3%
	LEED-ND	8.3%	0.0%	0.0%	33.3%	0.0%
PUD	25.0%	0.0%	0.0%	33.3%	66.7%	
Reduced Parking Stds	50.0%	66.7%	66.7%	0.0%	66.7%	
ENERGY						
EFFICIENCY	Solar Access Protection	58.3%	66.7%	0.0%	33.3%	100.0%
	Wind Turbines	33.3%	33.3%	0.0%	0.0%	100.0%
	Carbon Neutral Reqs.	0.0%	0.0%	0.0%	0.0%	0.0%
	Green Building	25.0%	33.3%	33.3%	33.3%	0.0%
ADAPTATION						
	Green Infrastructure	0.0%	0.0%	0.0%	0.0%	0.0%
	SWM	100.0%	100.0%	100.0%	100.0%	100.0%
	Community Gardens	0.0%	0.0%	0.0%	0.0%	0.0%
	Urban Farming	0.0%	0.0%	0.0%	0.0%	0.0%
	Agricultural Protection	50.0%	33.3%	0.0%	33.3%	100.0%
	Floodplain Protection	100.0%	100.0%	100.0%	100.0%	100.0%

CLIMATE POLICY	ZONING TOOL	SUMMARY	Stressed	Job Center	Mature Bedrqn.	Dev Bedrqn.
SEQUESTRATION	Protect Tree Canopy	92.0%	66.7%	100.0%	100.0%	100.0%
	Urban Forestry	8.3%	0.0%	33.3%	0.0%	0.0%
	Forest Woodlands Pres	50.0%	0.0%	33.3%	0.0%	100.0%
	Open Space Preservation	91.6%	66.7%	100.0%	66.7%	100.0%
	Nat Resources Protection	75.0%	33.3%	66.7%	100.0%	100.0%
	Cluster/Conservation Sub	58.3%	0.0%	33.3%	100.0%	100.0%
SUSTAINABLE						
LAND PLANNING	Infill Development	41.6%	66.7%	66.7%	0.0%	33.3%
	Mixed-Use Devt.	100.0%	100.0%	100.0%	100.0%	100.0%
	Enhancing Walkability	75.0%	66.7%	100.0%	100.0%	33.3%
	Enhancing Bikeability	33.3%	33.3%	33.3%	66.7%	0.0%
	TDR	16.6%	0.0%	0.0%	0.0%	66.7%
	TOD	25.0%	33.3%	66.7%	33.3%	0.0%
	Live/Work Units	33.3%	33.3%	66.7%	0.0%	33.3%
	LEED-ND	8.3%	0.0%	0.0%	33.3%	0.0%
PUD	25.0%	0.0%	0.0%	33.3%	66.7%	
Reduced Parking Stds	50.0%	66.7%	66.7%	0.0%	66.7%	
ENERGY						
EFFICIENCY	Solar Access Protection	58.3%	66.7%	0.0%	33.3%	100.0%
	Wind Turbines	33.3%	33.3%	0.0%	0.0%	100.0%
	Carbon Neutral Reqs.	0.0%	0.0%	0.0%	0.0%	0.0%
	Green Building	25.0%	33.3%	33.3%	33.3%	0.0%
ADAPTATION						
	Green Infrastructure	0.0%	0.0%	0.0%	0.0%	0.0%
	SWM	100.0%	100.0%	100.0%	100.0%	100.0%
	Community Gardens	0.0%	0.0%	0.0%	0.0%	0.0%
	Urban Farming	0.0%	0.0%	0.0%	0.0%	0.0%
	Agricultural Protection	50.0%	33.3%	0.0%	33.3%	100.0%
	Floodplain Protection	100.0%	100.0%	100.0%	100.0%	100.0%



Preliminary Findings

- Climate change presently not a motivator for change in suburban communities studied
 - Need to adopt mitigation and adaptation approaches more widely
 - Link to other planning and policy agendas
- Suburbs are continuing to shift away from Euclidean zoning to performance and incentive-based zoning approaches
- Sequestration efforts are broadly accepted
- Mixed use development has gained acceptance in concept, however there is resistance to allowing needed densities
- TDR has gained acceptance in concept but hasn't been implemented
- Transit oriented development is widely accepted but not feasible in all communities
- Use of overlay districts a common strategy
- Different types of suburbs vary in their conditions, their needs and their possibilities for action

Thank you!

*Dorothy Ives Dewey, Ph.D., AICP
Professor and Chair
Geography & Planning Department
West Chester University
West Chester, PA*

divesdewey@wcupa.edu