

Relationships of Urban Containment Policies to Physical Activity: A Longitudinal Analysis of Large U.S. Metropolitan Areas

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In the News...

Smart Growth Makes a Statement with Governors

State governments can either enable or stymie communities that want to plan and invest for a more livable future...

Smart Growth Planning Part of Gov. Spitzer's Goal for Cleaner, Greener New York

Transportation investments must be accompanied by smart-growth planning, which will alleviate environmental degradation, and will make our communities more vibrant places to live

Smart, Quality Growth – Preparing for Florida's Future

Smart Growth at the Ballot Box

Governors in at least 13 states were elected or re-elected on platforms with strong calls for moves such as focusing investment on existing cities, towns and suburbs; expanding affordable housing options near job centers; balanced transportation investments

Urban Containment Policies

- Adopted at the state, metropolitan, county, or municipal levels
- Intended to manage the location, character, and timing of urban growth
 - Goals:
 - Compact development
 - Preservation of open space
 - Efficient use of infrastructure
 - Promotion of social equity
 - Implementation tools:
 - Urban growth boundaries
 - Infrastructure service areas/adequate public facilities ordinances
 - Greenbelts



Background: Previous Studies

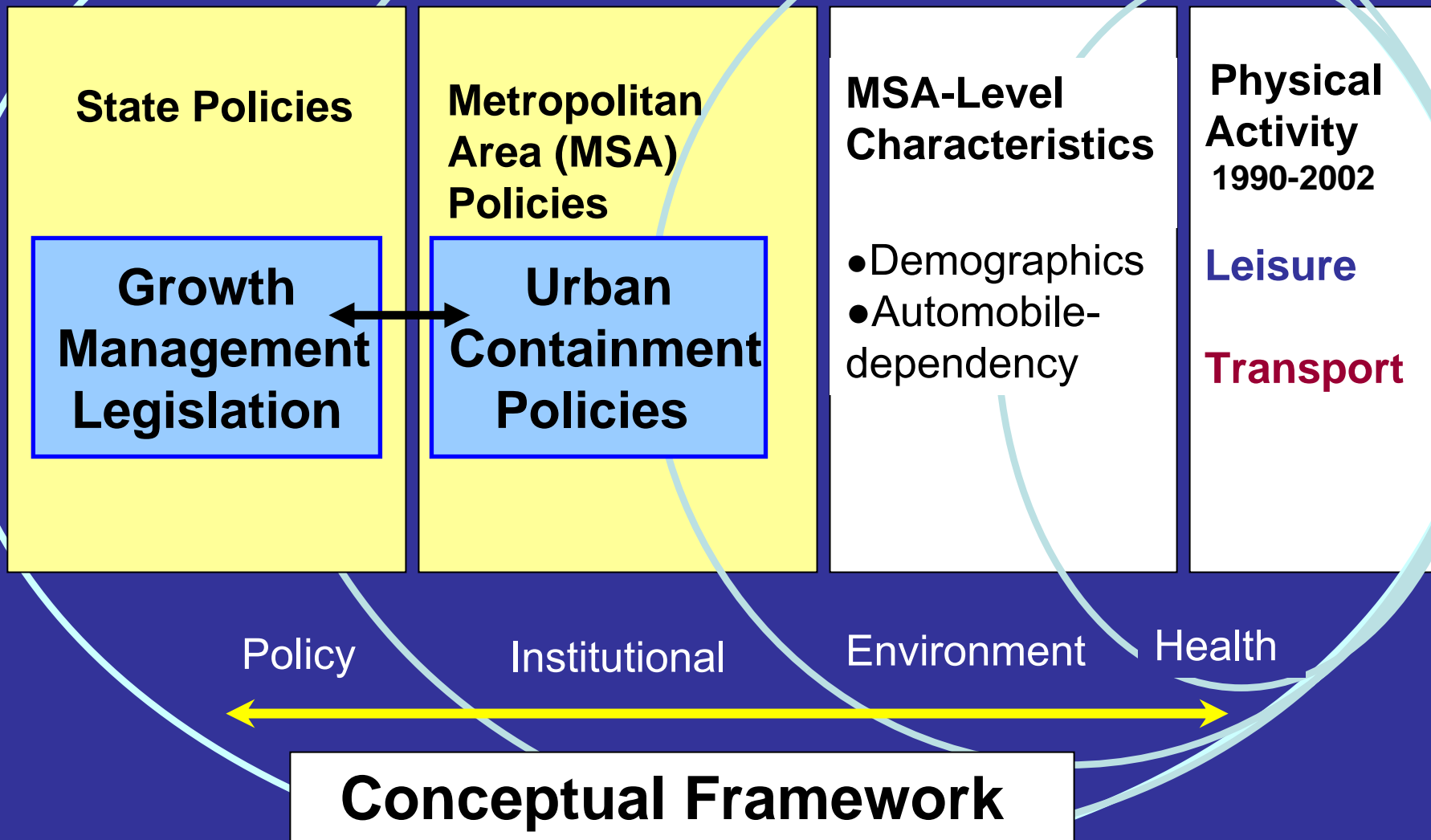
- Features of the built environment associated with physical activity
 - Access to parks, open space, recreational facilities
 - Mixed residential and commercial land uses
 - Higher densities
 - Connected multi-modal transportation systems
- Limited research examining the role of macro-level policies that may facilitate development patterns supportive of these attributes

Limitations in Existing Literature

- Few longitudinal studies
- Public health surveillance systems focus on leisure-time physical activity
- Relationships of containment policies to physical activity remain unexplored

Objective

- Examine relationships between urban containment policies, state adoption of growth management legislation, and physical activity
 - 1990-2002
 - 63 large U.S. metropolitan statistical areas (MSAs)



Data Sources

Policies

Planning Advisory Service Report #520

- Nelson & Dawkins, 2004

Published Studies

(e.g., Wassmer 2006; Rodriguez 2006; Gale 1992; Weitz 1999, Burby & May 1997; Carruthers 2002)

Daily Vehicle Miles Traveled Per Capita

Texas Transportation Institute Urban Mobility Report

Net Density

Natural Resources Inventory

1990 - 2002

MSA Socio-demographics

U.S. Census

- Percent Black
- Percent \geq High School Education
- Percent \geq Age 65
- Household Income
- Population Size

Physical Activity

• Leisure: Behavioral Risk Factor Surveillance System (BRFSS)

• Walking & Bicycling to Work: U.S. Census

Policy Measures

- Urban Containment Policies (UCP)
 - Presence of a formally adopted urban growth boundary, urban service limit, or greenbelt in one or more jurisdictions within the MSA

Urban Containment Policy Classification

Source: Nelson and Dawkins (2004)

Strong

- Incorporate a variety of implementation tools to direct growth toward designated urban areas
 - Rural land policies to prevent low density sprawl
 - Strong housing affordability, infrastructure, and open space policies
 - Strong intergovernmental coordination

Weak

- Lack policies to contain the outward spread of development
- Weak intergovernmental coordination



State Growth Management Legislation

- n=10 states

Oregon, RI, Florida, Georgia, Maryland, Washington,
Minnesota, Connecticut, Tennessee, Arizona

- 2 Approaches:

- Enabling Legislation

- Legislation mandating adoption of Urban Growth Boundaries (UGBs)

MSA Sample

**n=63 MSAs
(in 31 states)**

No Policies

n=33

**State Legislation
Only**

n=6

Atlanta
Hartford/Middleton
Memphis
Nashville
Providence
Phoenix

**MSA-level
Policy Only**

n=12

Albuquerque
Austin
Charlotte
Denver
Norfolk
Philadelphia
Riverside-
San Bernardino
Sacramento
San Diego
San Francisco
San Jose
Washington, DC

**State and
MSA-level
Policies**

n=12

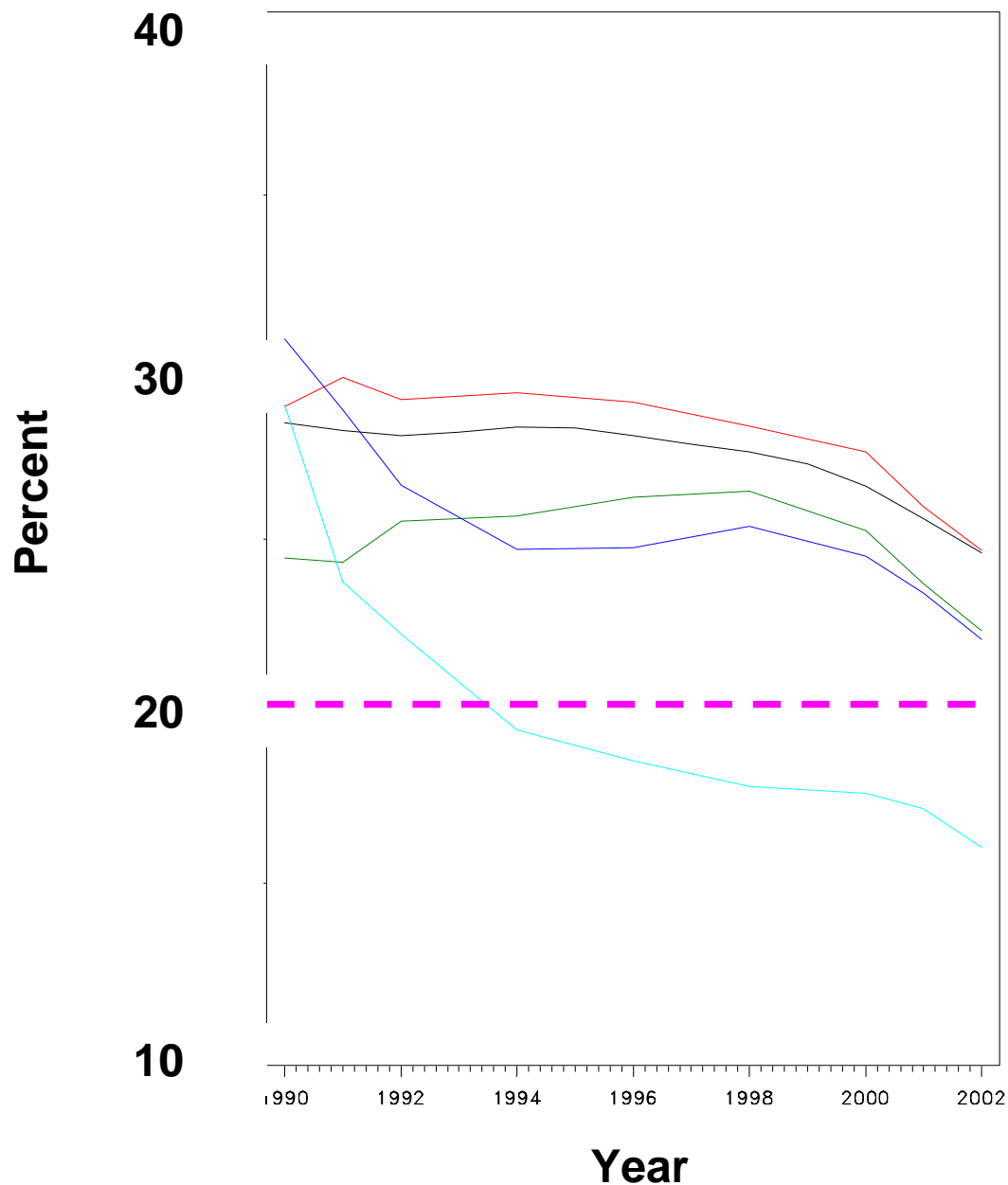
Baltimore
Minneapolis
Miami
Ft. Lauderdale
Jacksonville, Tucson
Orlando, Tampa
Portland, Seattle,
Tacoma, Spokane

Statistical Analysis

- Linear mixed models
 - Repeated measurements (level 1) nested within MSA (level 2)
 - Random intercepts; random slopes
 - Covariates
 - Time-varying and baseline (1990)
- Estimated the pattern of change from 1990-2002 in the proportion of the population in each MSA who reported being physically active, given the presence or absence of policies

Results

Percent No Leisure-Time Physical Activity, 1990-2002



**Urban
Containment
Policy (UCP)
Classification:**

Nationwide Trend

No UCP

Weak UCP

**Strong UCP
(Enabling or No
State Legislation)**

**Strong UCP
and State
Legislation
Mandating UGB**

**---Healthy People
2010 Target**

*Unadjusted for SES

Proportion No Leisure-Time Physical Activity, 1990-2002

Variable	Model 1 Adjusted Estimate	Model 2 Adjusted Estimate
Intercept (Proportion No LTPA in 1990)	25.35****	25.74****
Year	0.94****	0.98****
Year Sq	-0.07****	-0.08****
State Legislation (Referent=None)		
Enabling	1.13	2.03***
Mandate UGB	-3.28**	-1.81
MSA Urban Containment Policy (Referent=None)		
Weak	-	-1.80*
Strong	-	-2.40***
<i>% Between-MSA Variance Explained</i>	75%	78%

****p≤0.001; ***p≤0.01; **p≤0.05; *p≤0.10

Adjusted for median household income, percent ≥ high school, percent black in 1990, percent ≥ Age 65 in 1990

Mean Minutes Leisure Physical Activity Per Week, 1990-2000

Variable	Model 1 Estimate (Adjusted)	Model 2 Estimate (Adjusted)
Intercept (Mean Minutes Leisure PA/week 1990)	178.20****	175.86****
Year	0.92	0.76
State Legislation (Referent=None)		
Enabling	-4.26	-12.47
Mandate UGB	53.45***	41.16**
MSA Containment Policy (Referent=None)	-	
Weak	-	18.36*
Strong	-	21.09**
Daily VMT per Capita (slope)	-4.50**	-4.21**
<i>% Between-MSA Variance Explained</i>	61%	69%

****p≤0.001; ***p≤0.01; **p≤0.05; *p≤0.10

Adjusted for median household income, percent ≥ high school, percent black in 1990, percent ≥ Age 65 in 1990, daily VMT per capital in 1990

Percent Walking or Bicycling to Work, 1990-2000

Variable	Model 1 Adjusted Estimate	Model 2 Adjusted Estimate
Intercept (Percent Walk/Bike to Work, 1990)	3.21****	3.18****
Year	-0.09****	-0.09****
State Legislation (Referent=None)		
Enabling	-0.10****	-0.09****
Mandate UGB	0.65	0.60
MSA Urban Containment Policy (Referent=None)		
Weak	-	0.06
Strong	-	0.09***
Daily VMT per capita in 1990	-0.14****	-0.14***
Density	0.39****	0.40****
<i>% Between-MSA Variance Explained</i>	60%	60%

Adjusted for median household income, percent ≥ high school, percent black in 1990, percent ≥ Age 65 in 1990

Limitations

- Self-report of physical activity
 - Lack of detailed transportation-PA data
- Lack of cohort data
- Potential misclassification of policies
- Time lag between policy adoption and implementation
 - Mechanism not determined

Strengths

- Longitudinal design
- Combination of data sources
- Large sample of diverse metropolitan areas
- Measurement of both state and MSA policies



Conclusions

- Metropolitan areas with strong urban containment policies have maintained higher population levels of leisure-time physical activity and active commuting from 1990-2002
 - Role of state, MSA, and local policies
 - Future studies:
 - Explore policy processes
 - Examine health and equity implications in diverse communities



Acknowledgements

We gratefully acknowledge
The Robert Wood Johnson
Foundation's Active Living
Research program for
supporting this research.

The first author is also
supported by NIH, NHLBI,
Public Health Service
Training Grant



Questions?

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