

# Lot Size, Zoning, and Household Preferences: Impediments to Smart Growth?

Elizabeth Kopits

*U.S. EPA-National Center for Environmental Economics*

Virginia McConnell

*UMBC and Resources for the Future*

Daniel Miles

*UMBC*

MD Smart Growth @10 Conference

October 4, 2007

The views expressed in this paper are those of the authors and do not necessarily represent those of the U.S. Environmental Protection Agency. No official Agency endorsement should be inferred.

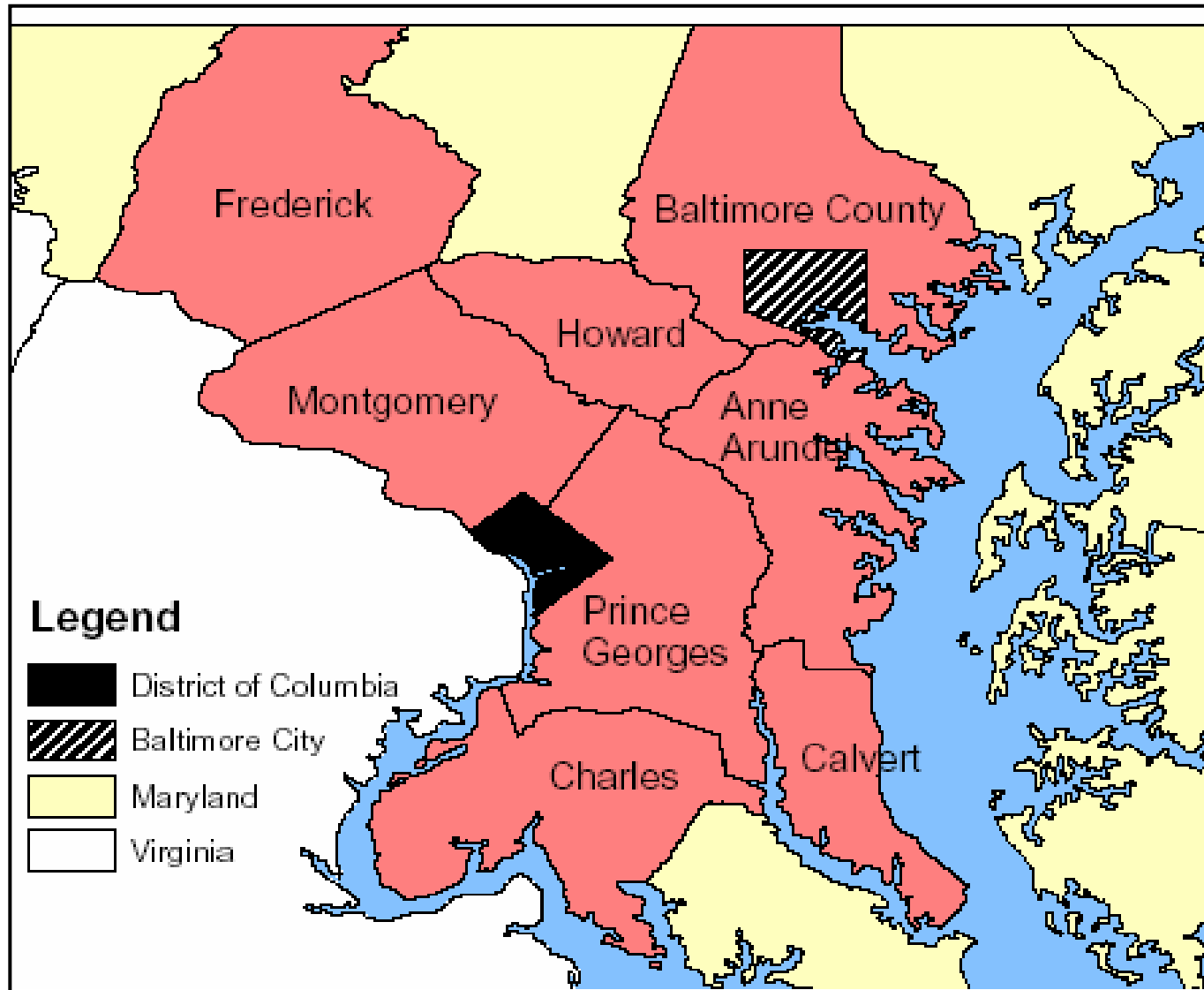
# Potential obstacles to Smart Growth goal of higher density development

- Large lot zoning
- Household preferences
  - New homebuyer preference for larger lots
  - Existing residents' resistance to higher density

# What has been the experience in Maryland?

- Are lot sizes increasing or decreasing?
- Is zoning constraining density?
- How strong are household preferences for lot size?

# Maryland Study Region



# I. Evidence on Lot Size, 8 Counties

Single-Family (SF) Development, Built 1970-2005

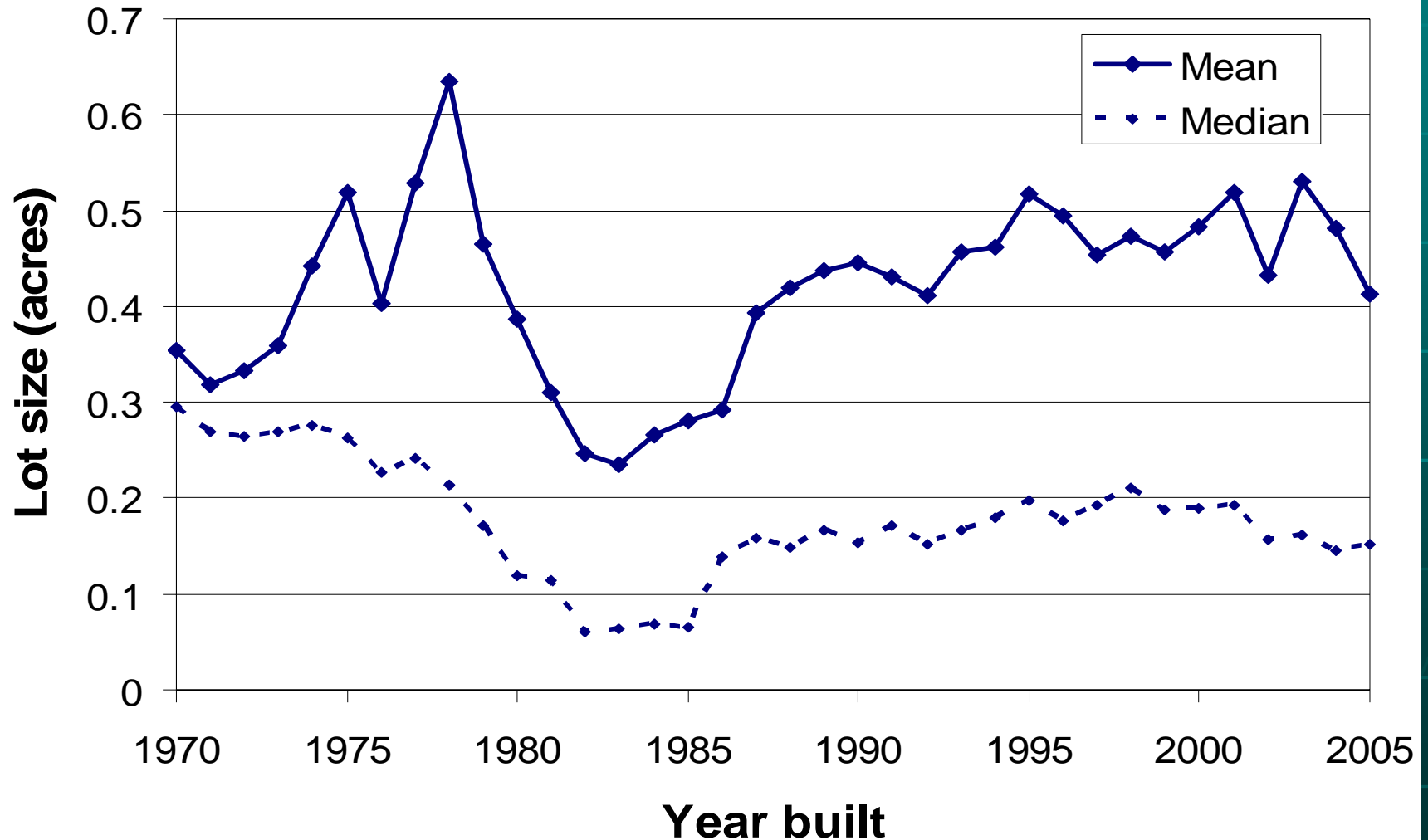
- Mean lot size of recently built units (1996-2005)
  - ≤ 0.5 acres in Anne Arundel, Montgomery, PG
  - ~0.7 acres in Baltimore, Frederick, Howard
  - > 1.2 acres in Charles, Calvert
- Mean > median lot size in all counties

# Trends in Lot Size

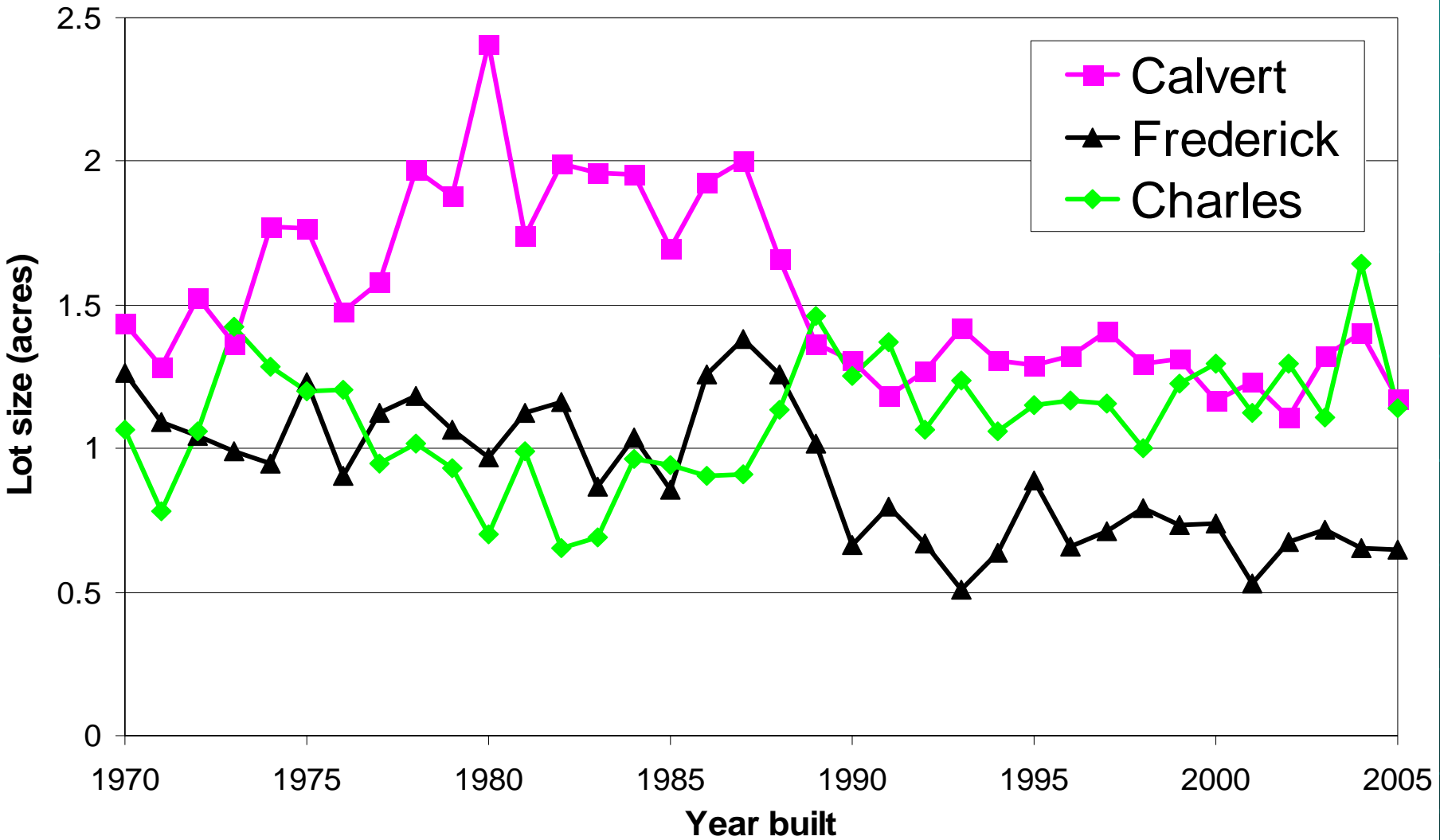
- Overall, little consistent upward or downward trend
- Lot size decreased in late 1970s/early 80s in many counties, but increased again in the 90s
- Declines in lot size in some exurban counties (Calvert, Frederick) suggest flattening of urban density gradient in 90s

Note: Analysis does not include multi-family housing

# Lot size of New SF Development, Montgomery County, 1970-2005

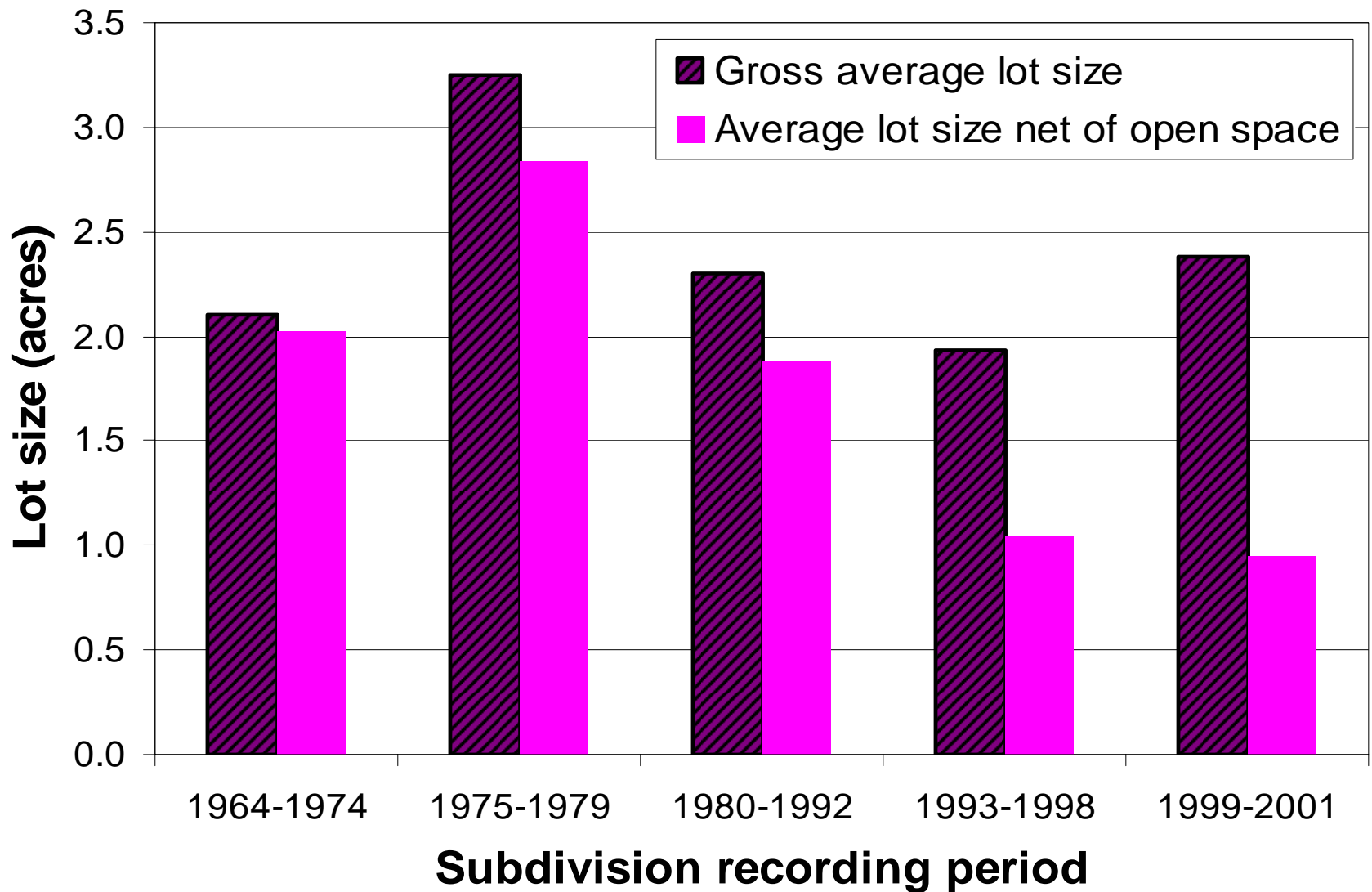


# Mean Lot size of New SF Development, Ex-urban Counties, 1970-2005



# Gross vs. Net Subdivision Density

## Calvert County, 1964-2001

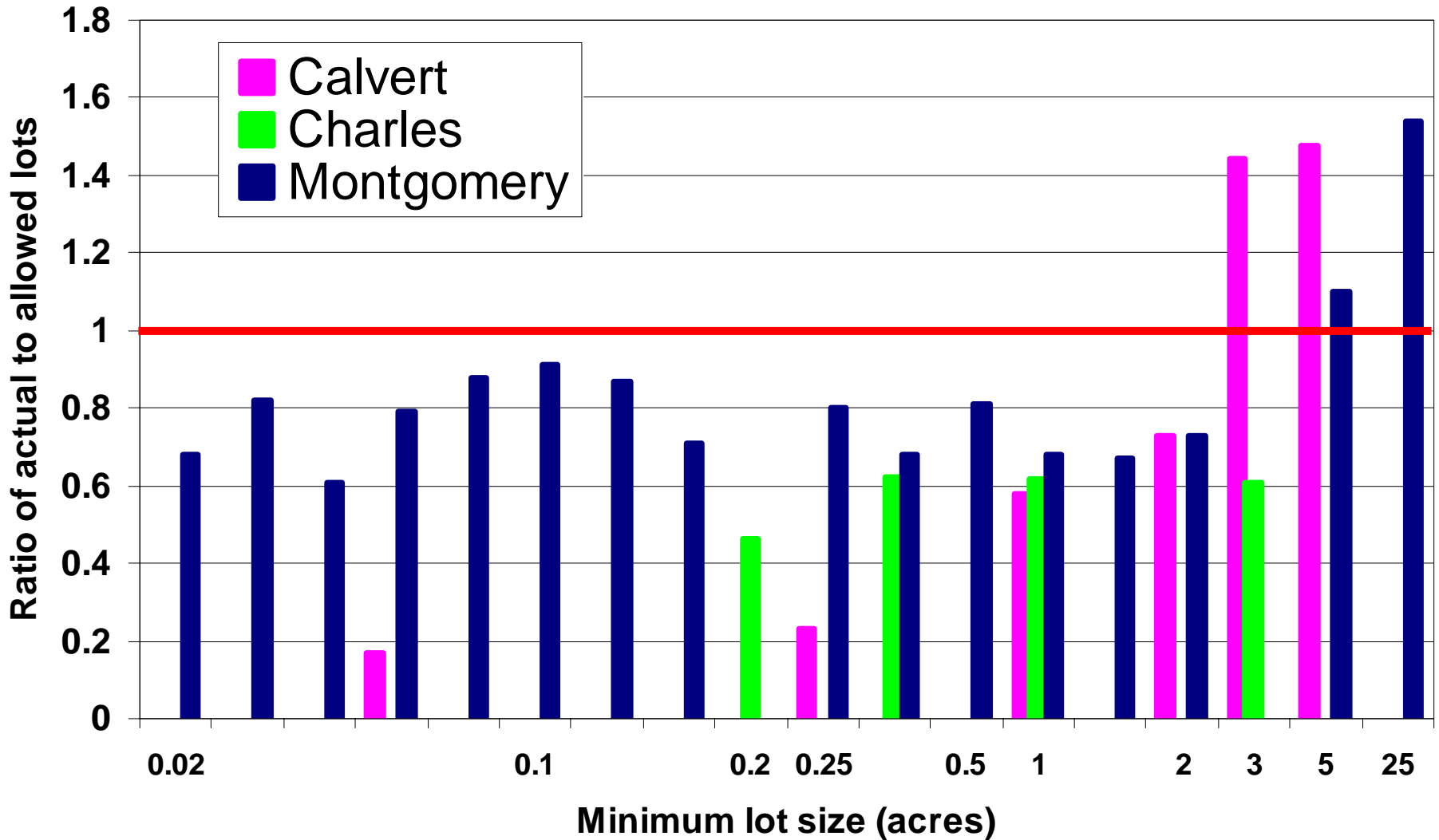


## II. Actual vs. Maximum Density Allowed by Zoning

Subdivision data from Montgomery (1980-2004), Calvert (1967-2001), Charles (1992-2005)

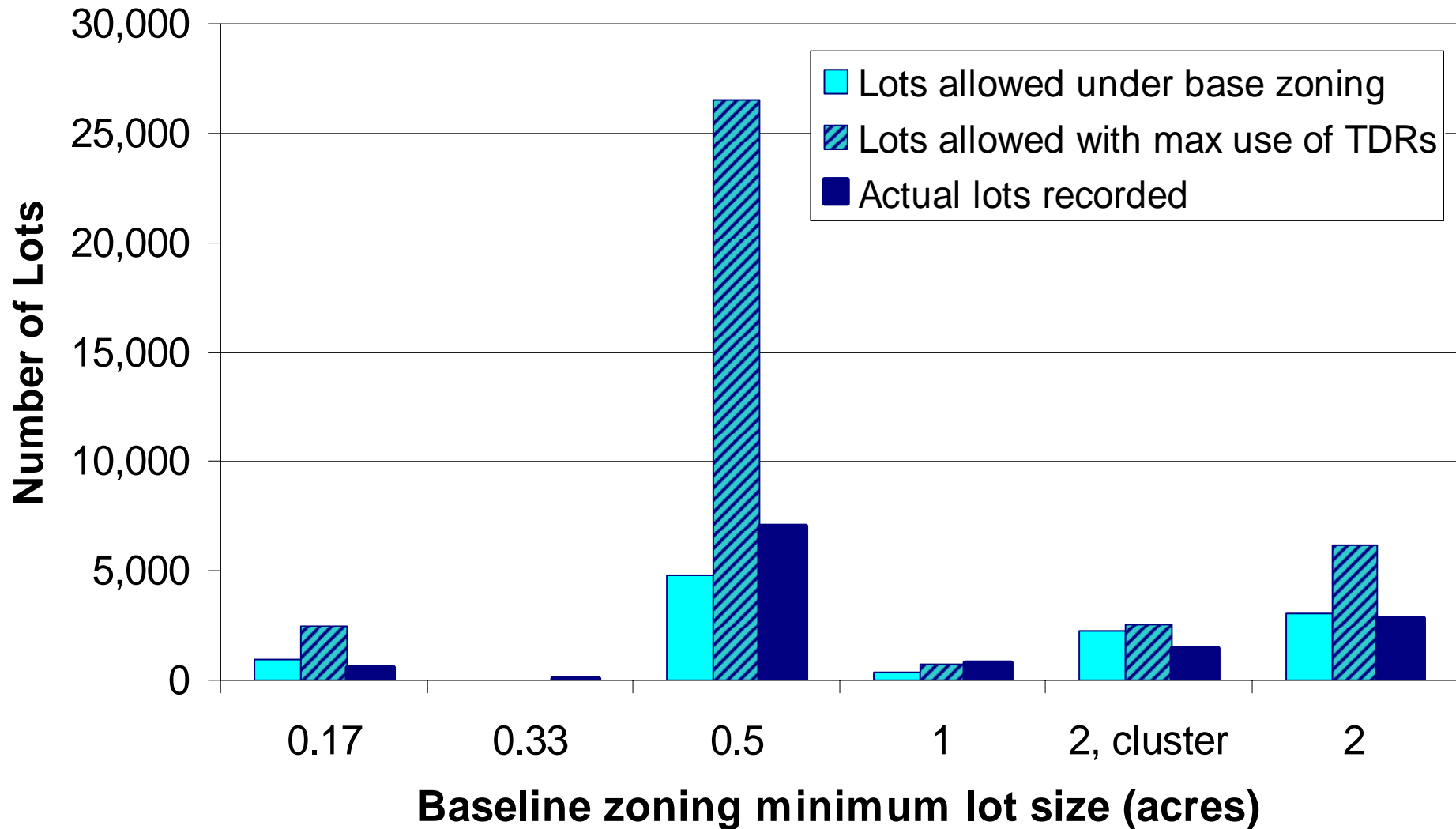
- Rural minimum lot size zoning  $\geq 3$  acres appears to constrain density in Calvert & Montgomery, less so in Charles
- Residential areas, towns are generally not built to density permitted
- TDRs offer extra density in many areas, but generally not used to the limit allowed

# Ratio of Actual to Allowable Zoned Density



# Baseline & Max TDR Lots vs. Actual Lots

## Montgomery subdivisions using TDRs, 1980-2004



# III. Evidence on Household Preferences for Lot Size

How do homebuyers value lot size, and are they willing to trade off lot size for larger houses?

- Estimate simple hedonic property price model – includes subdivision and sale year fixed effects
- Use data on house sales in Montgomery (1981-2005) and Calvert (1981-2001)

# Estimated Marginal Value of Lot Size

	Calvert	Montgomery
Sample Average (evaluated at mean values of interacted variables)	0.022**	0.112**
Sold in 1985	0.023**	0.170**
Sold in 2000	0.020**	0.096**
For 2000 ft <sup>2</sup> house	0.022**	0.123**
For 3000 ft <sup>2</sup> house	0.014*	0.105**

\*\* Significant at 99%, \*at 95% level

# Results

- Value of additional acre is larger in more urbanized county
  - Leads to 2% increase in house price in Calvert
  - Leads to 11% increase in Montgomery
- Value of larger lots decreases over time in Montgomery
- Homebuyers are willing to trade off lot size for house size
  - For 1000 sq. ft. increase in house size, marginal value of lot size fell by 1% in Calvert, 2% in Montgomery

# Conclusions/ Implications for Smart Growth in MD?

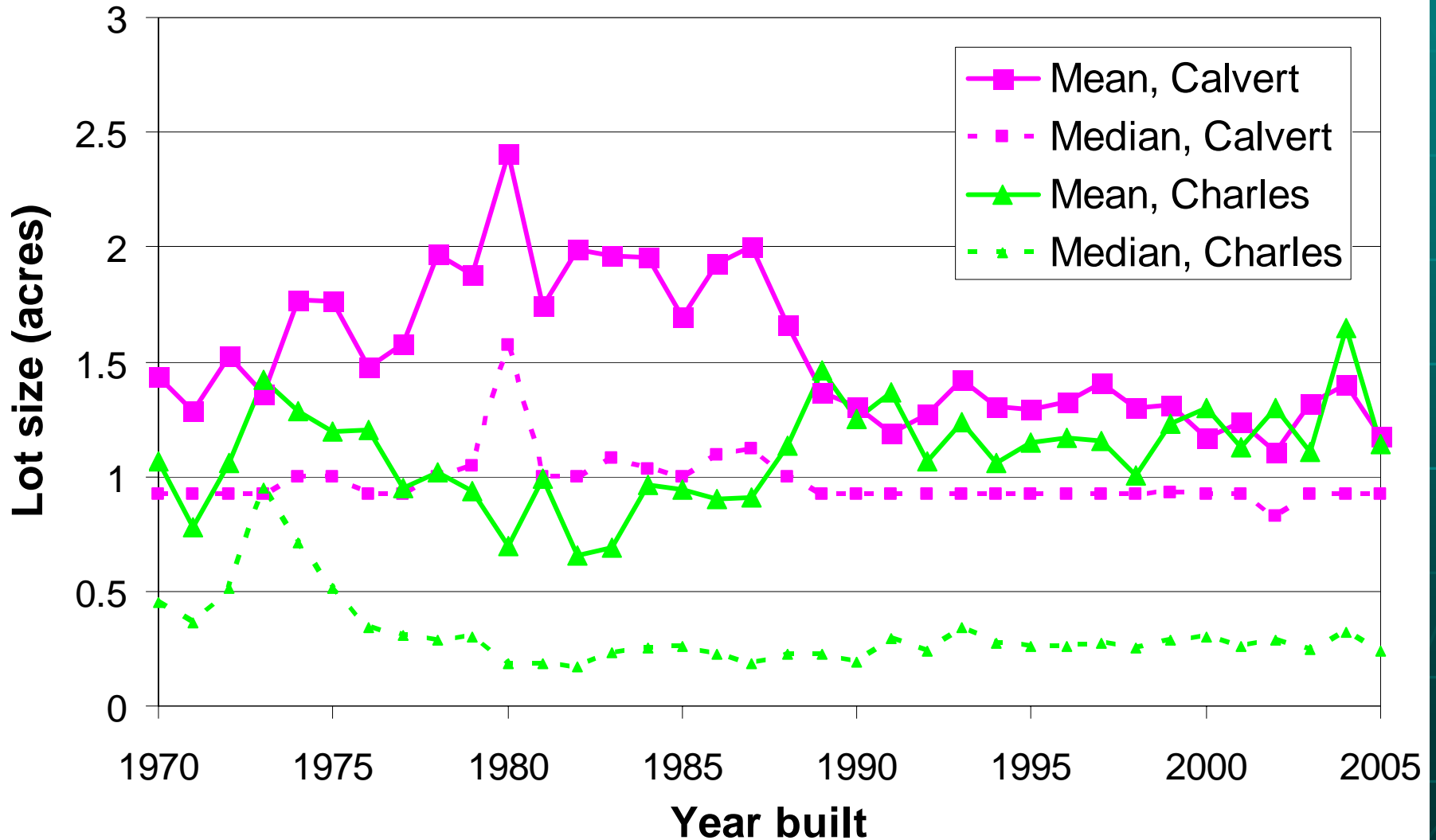
- Lot size varies considerably across counties, no strong trend toward higher density
- Zoning does not appear to be determining lot size, except in areas requiring very large lots
- Bigger issue may be household preferences for larger lots
- Alternative policies for higher density?

**EXTRA SLIDES**

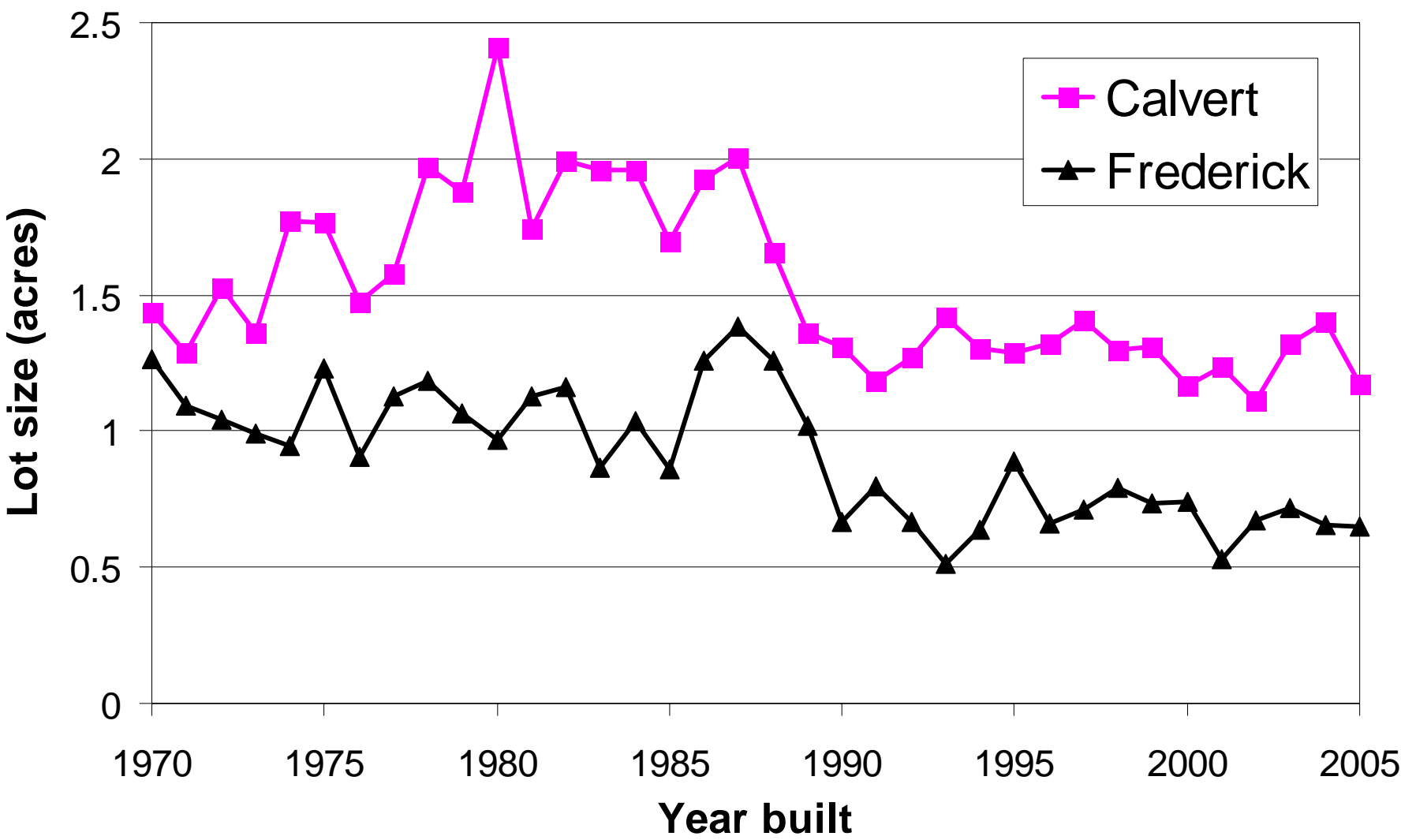
# New Single-Family (SF) Residential Development

County	% of all residential units	Lot Size of units built 1996-2005		
		Median	Mean	Std.Dev.
Anne Arundel	82%	0.2	0.5	1.2
Baltimore Cty	48%	0.2	0.7	1.5
Calvert	98%	0.9	1.3	1.7
Charles	93%	0.3	1.2	2.1
Frederick	87%	0.2	0.7	1.7
Howard	74%	0.3	0.7	1.2
Montgomery	67%	0.2	0.5	1.1
Prince Georges	65%	0.2	0.4	0.8
Total	68%			

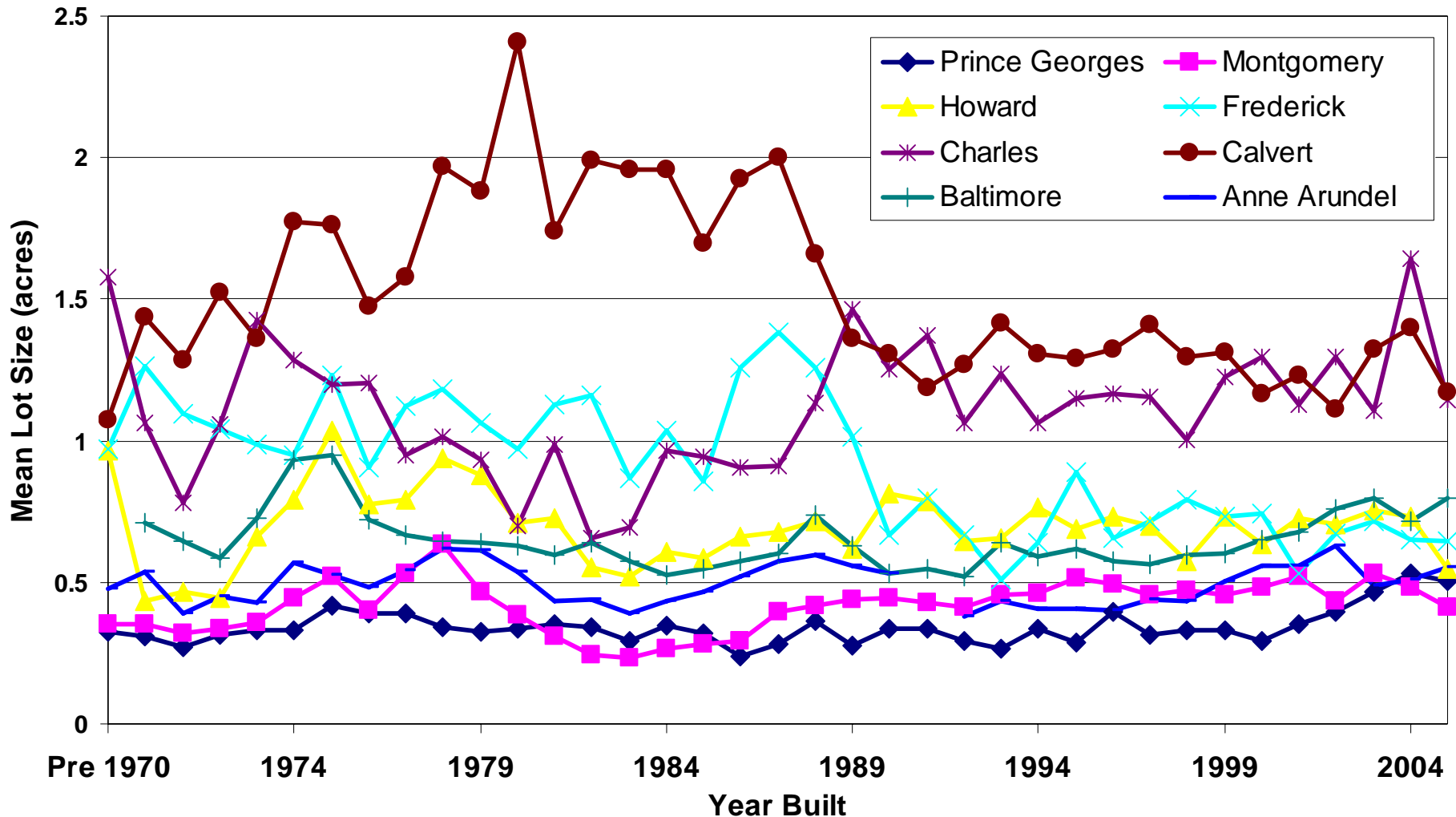
# Lot size of New SF Development, Calvert & Charles County, 1970-2005



# Mean Lot size of New SF Development, Calvert & Frederick, 1970-2005



# Mean lot size of new SF residential development



# Summary Statistics

## Single Family House Sales, Calvert & Montgomery Counties

Variable	Calvert		Montgomery	
	Mean	Std.Dev.	Mean	Std.Dev.
Sale price	193233	72655	366522	227567
Lot size (acres)	1.5	1.6	0.3	0.4
House size (ft <sup>2</sup> )	2081.9	802.9	2640.4	963.5
Age (yrs)	5.8	10.0	6.9	8.2
Sale year	1994.4	5.1	1996.9	6.5
#sales,	3,352		22,575	
subdivisions	89		1,148	

# Hedonic Regression Results, Calvert and Montgomery County

Dependent Variable:  $\ln(\text{house sale price})$

<i>Dependent Var:</i> <i><math>\ln(\text{house sale price})</math></i>	Calvert <i>coeff. (s.e.)</i>	Montgomery <i>coeff. (s.e.)</i>
Lotsize	0.44581	9.96370**
Lotsize <sup>2</sup>	- 0.00028	- 0.00603
House size	0.00015**	0.00015**
Lotsize*House size	- 0.00001**	- 0.00002**
Age	- 0.00266**	- 0.00501**
Lotsize*Age	0.00012*	0.00300**
Lotsize*Sale year	- 0.00020	- 0.00492**
Constant	11.12193**	11.45378**