

# Factors affecting Residential Property Values in a Small Historic Canadian University Town

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# In Nova Scotia

## Geography

In Nova Scotia

Wolfville

Demographics #1

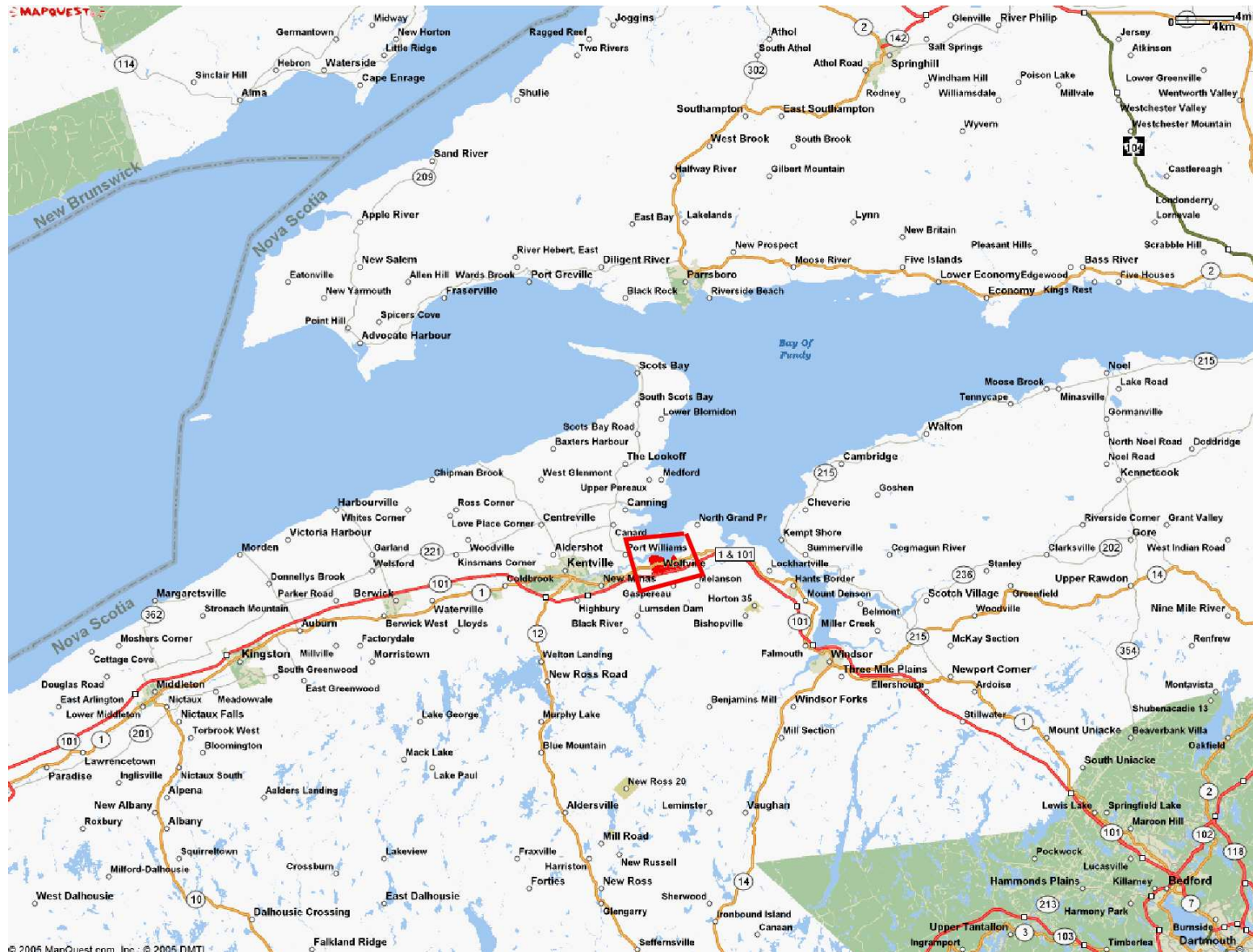
Demographics #2

## Background

## Data

## Econometric Results

## Conclusion



# Wolfville

## Geography

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# Demographics #1

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	Wolfville		Nova Scotia	
	Total	%	Total	%
Population	3,658		908,007	
Median Age	39.3		38.8	
Private households	1,615		360,020	
Rented dwellings	840	52	103,305	29
Owner occupied	775	48	252,150	70
Total trips to work	1,470		373,045	
Motor vehicle	1,045	71	280,365	85
Walk or bike	365	25	33,130	9

# Demographics #2

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	Wolfville		Nova Scotia	
	Total	%	Total	%
Median Income	16,663	89	18,735	100
Average Earnings	43,583	115	37,872	100
With degree, diploma, ...				
Aged 20-34		38.7		22.8
Aged 35-44		55.6		19.6
Aged 45-64		59.0		18.1
Occupation - total	1,780		442,420	
Education ...	450	25	33,375	8
Culture ...	165	9	11,125	3

# Urban Amenities and Externalities #1

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Urban Amenities and Externalities #2

Zoning: Objectives

Zoning: Efficiency

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## ■ Sound

- Traffic noise reduces property values by between 0.1% and 2.3% (Nelson, 1982; Wilhelmsson, 2000; Navrud, 2002; Theebe, 2004).
- Airport noise reduces property values by about 0.6% (Lipscomb, 2003; Nelson, 2004).
- Access to transportation or employment can be offsetting.



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- Airport noise reduces property values by about 0.6% (Lipscomb, 2003; Nelson, 2004).
- Access to transportation or employment can be offsetting.

## ■ Race

- Premium for racially homogeneous neighbourhoods (Crecine et al., 1967; Maser et al., 1977; Cervero and Duncan, 2004).

# Urban Amenities and Externalities #2

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Urban Amenities and  
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## ■ Density

- Premium for near open space, away from density (Stull, 1975; Turner, 2004).



# Urban Amenities and Externalities #2

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## ■ Density

- Premium for near open space, away from density (Stull, 1975; Turner, 2004).

## ■ Maintenance Level

- Premium for separation from rental housing, which is generally not well maintained (Ko Wang et al, 1991).

# Zoning: Objectives

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- Management of externalities
  - Separates conflicting uses, minimizing externality costs.
  - Provides information about externalities to buyers.

# Zoning: Objectives

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- Management of externalities
  - Separates conflicting uses, minimizing externality costs.
  - Provides information about externalities to buyers.
  
- Fiscal zoning
  - Protection of property values
  - Maintenance of tax base
  - Maintenance of demographic segregation

# Zoning: Efficiency

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- Efficient if aggregate wellbeing increases relative to market.
  - Managing externalities may be welfare increasing.
  - Externality effect should not be detectable if zoning efficient.

# Zoning: Efficiency

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- Efficient if aggregate wellbeing increases relative to market.
  - Managing externalities may be welfare increasing.
  - Externality effect should not be detectable if zoning efficient.
- Fiscal zoning generally inefficient.
  - Opportunities for profitable trade limited.

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Real Estate Summary

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Real Estate Summary

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- Property values from MLS records together with selling price.
  - Time: July 1998 - June 2003.
  - Data files parsed with PERL script.
  - View, paved drive, landscaping, etc. assessed by 'walk past' of all lots.

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- Property values from MLS records together with selling price.
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  - Data files parsed with PERL script.
  - View, paved drive, landscaping, etc. assessed by 'walk past' of all lots.
  
- Sound observations
  - Larson-Davis<sup>TM</sup> Model 712 sound meter
  - Student assistant, summer 2003.
  - Back yards of university faculty throughout Wolfville



# Real Estate Summary #1

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Description	Mean	Median	Min	Max
Selling Price	136,770	123,500	28,500	399,000
Age of home	45.3	25	0	176
Living space ( $m^2$ )	148.0	127.7	53.1	447.6
Lot ( $m^2$ )	1,119.0	958.1	0.0	12,100.0
Full baths	1.67	2	1	4
Half baths	0.36	0	0	5
to town center ( $km$ )	0.607	0.881	0.134	1.510
to center campus ( $km$ )	0.688	0.853	0.211	1.906
Bedrooms	-	3	1	7
Days on market	124.2	128.2	0	596
View of water	0.21	-	-	-
Not historic	0.02	-	-	-
Driveway paved	0.76	-	-	-

# Real Estate Summary #2

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Description	Categories				
	Electric	Oil	Wood	Other	
Heat Source	54	75	17	3	
Zoning	R-1	R-1A	R-2/4	R-8	RCDD
Garage	44	38	39	15	13
Trees	None	Free	Attached		
Title	92	21	27		
Year	None	Young	Mature		
Quarter	25	62	53		
	Free	Lease	Other		
	127	2	20		
	1998	1999	2000	2001	2002
	12	32	30	35	40
	Q1	Q2	Q3	Q4	
	32	54	36	27	

# Sound Observation Summary

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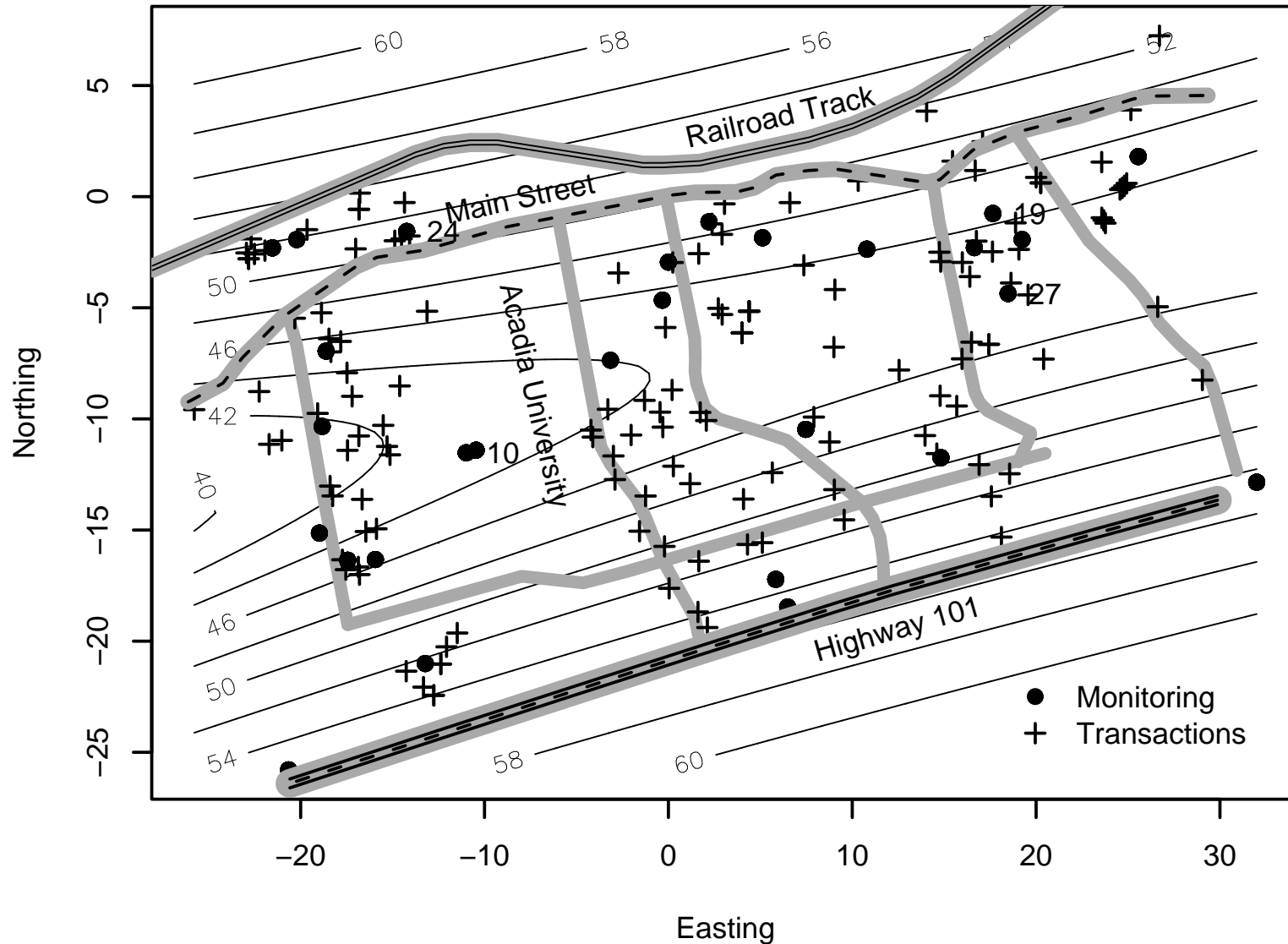
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Site		Mean	St. Dev.	Min.	Max.
Avg	$L_{eq}$	47.6	6.16	35.3	67.9
	Peak	82.8	9.40	61.2	110.2
Min	$L_{eq}$	41.8	2.39	38.0	46.1
	Peak	80.1	8.62	65.5	101.7
Max	$L_{eq}$	56.4	2.80	51.7	60.1
	Peak	89.7	5.21	82.8	102.8

# Sound Profile

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## ■ Surface Interpolation Methods

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- Surface Interpolation Methods
  - Simple Arithmetic Average
  - Distance Weighted Average
  - Spatial OLS Forecast
  - Polynomial Surface

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## ■ Surface Interpolation Methods

- Simple Arithmetic Average
- Distance Weighted Average
- Spatial OLS Forecast
- Polynomial Surface

■ No method produced a surface that adds significant explanatory power to hedonic regression.



# Model Selection

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- Method: Hedonic Regression.
- Common forms are linear and logarithmic
- Box-Cox transformation can provide information

# Model Selection

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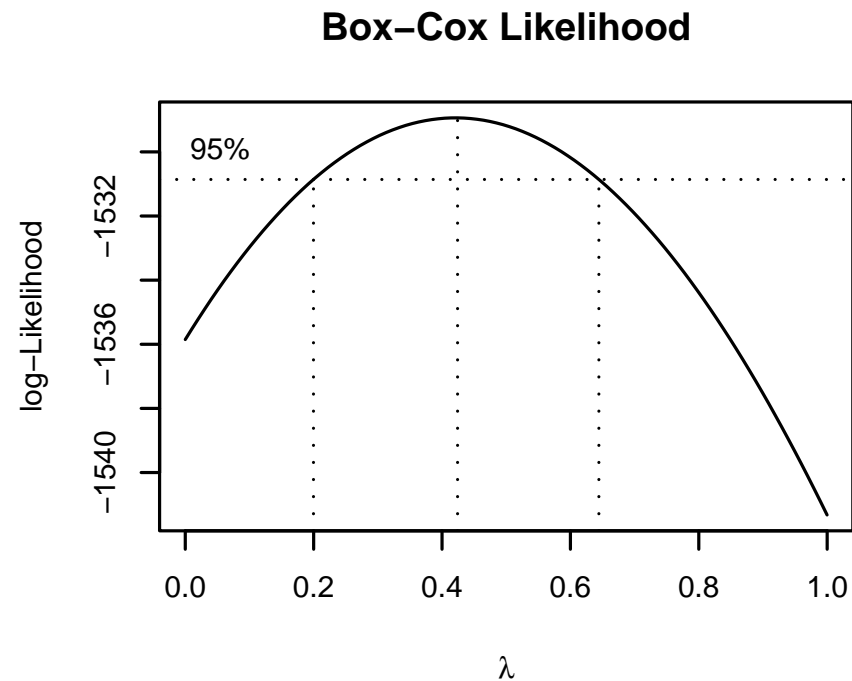
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- Method: Hedonic Regression.
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# Diagnostics

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	Linear		Square Root		Logarithmic	
	Stat.	<i>P</i>	Stat.	<i>P</i>	Stat.	<i>P</i>
$R^2$	0.90		0.89		0.88	
$df$	93		92		102	
$n$	115		115		123	
$F$	36.0	0.00	33.5	0.00	35.2	0.00
D-W	2.25	0.83	2.33	0.92	2.17	0.73
B-P	28.0	0.18	23.1	0.45	36.6	0.02
Moran	-0.04	0.11	-0.04	0.17	-0.02	0.60

# Results #1

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Factor	$\beta$	Square Root		$\Delta\%$
		$P_{\text{Trad}}$	$P_{\text{HCCM}}$	
<b>(Intercept)</b>	<b>269.4</b>	<b>0.000</b>	<b>0.026</b>	
<b>Age</b>	<b>- 0.93</b>	<b>0.015</b>	<b>0.025</b>	<b>0.26</b>
Age <sup>2</sup>	0.006	0.094	0.091	
Floor (m <sup>2</sup> )	0.907	<b>0.000</b>	0.062	0.32
Floor <sup>2</sup>	-0.001	0.075	0.267	
Lot (m <sup>2</sup> )	0.022	<b>0.004</b>	0.072	0.01
Lot <sup>2</sup>	-0.000	0.187	0.416	
<b>Full Baths</b>	<b>29.91</b>	<b>0.000</b>	<b>0.000</b>	<b>16.3</b>
Half Baths	19.11	<b>0.006</b>	0.124	10.4

# Results #2

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Factor	$\beta$	Square Root		$\Delta\%$
		$P_{\text{Trad}}$	$P_{\text{HCCM}}$	
<b>to Acadia (<i>km</i>)</b>	<b>-32.74</b>	<b>0.002</b>	<b>0.003</b>	<b>-0.18</b>
<b>to Main (<i>km</i>)</b>	<b>-45.48</b>	<b>0.004</b>	<b>0.005</b>	<b>-0.25</b>
<b>Zone R-1A</b>	<b>-22.92</b>	<b>0.015</b>	<b>0.018</b>	<b>-0.12</b>
<b>Zone R-2/4</b>	<b>-52.02</b>	<b>0.000</b>	<b>0.000</b>	<b>-0.26</b>
Zone R-8	-16.94	0.508	0.147	-0.09
<b>Zone RCDD</b>	<b>-52.55</b>	<b>0.043</b>	<b>0.000</b>	<b>-0.27</b>
Not Historic	-47.33	0.108	0.371	-0.26
Paved Drive	-9.96	0.213	0.142	-0.05

# Results #3

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Factor	$\beta$	Square Root	
		$P_{\text{Trad}}$	$P_{\text{HCCM}}$
Year 1999	19.41	0.148	0.103
<b>Year 2000</b>	<b>26.68</b>	<b>0.037</b>	<b>0.023</b>
<b>Year 2001</b>	<b>52.11</b>	<b>0.000</b>	<b>0.002</b>
<b>Year 2002</b>	<b>56.42</b>	<b>0.000</b>	<b>0.000</b>
Quarter II	11.96	0.178	0.096
Quarter III	5.63	0.554	0.317
Quarter IV	28.63	<b>0.014</b>	0.089

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Conclusions

- Home age, size, etc. as expected
- Age effect rather small.



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Conclusions

- Home age, size, etc. as expected
  - Age effect rather small.
- Sound level and view not detectable effect.
  - Efficiently managed by zoning or sound level too low.

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Conclusions

- Home age, size, etc. as expected
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- Historic designation increases value.

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- Historic designation increases value.
- Zoning strong effect, single family most valuable.

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Conclusions

- Home age, size, etc. as expected
  - Age effect rather small.
- Sound level and view not detectable effect.
  - Efficiently managed by zoning or sound level too low.
- Historic designation increases value.
- Zoning strong effect, single family most valuable.
- Proximity to Acadia negatively related to price
  - Zoning not efficient with respect to this externality.