

The Effect of Strict Agricultural Zoning on Agricultural Land Values: The Case of Ontario's Greenbelt

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Ontario's Greenbelt

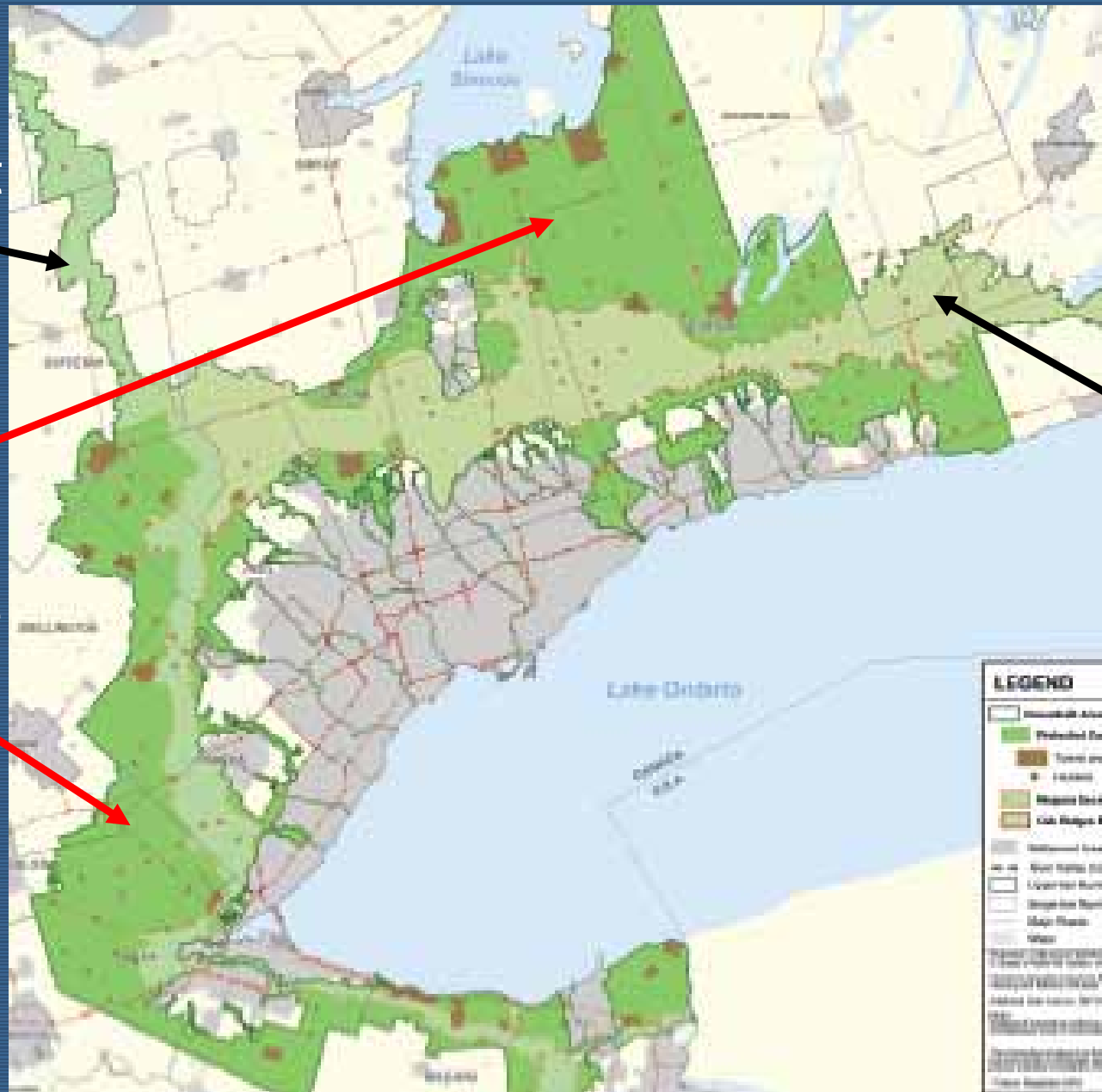


Three Zones of the Greenbelt

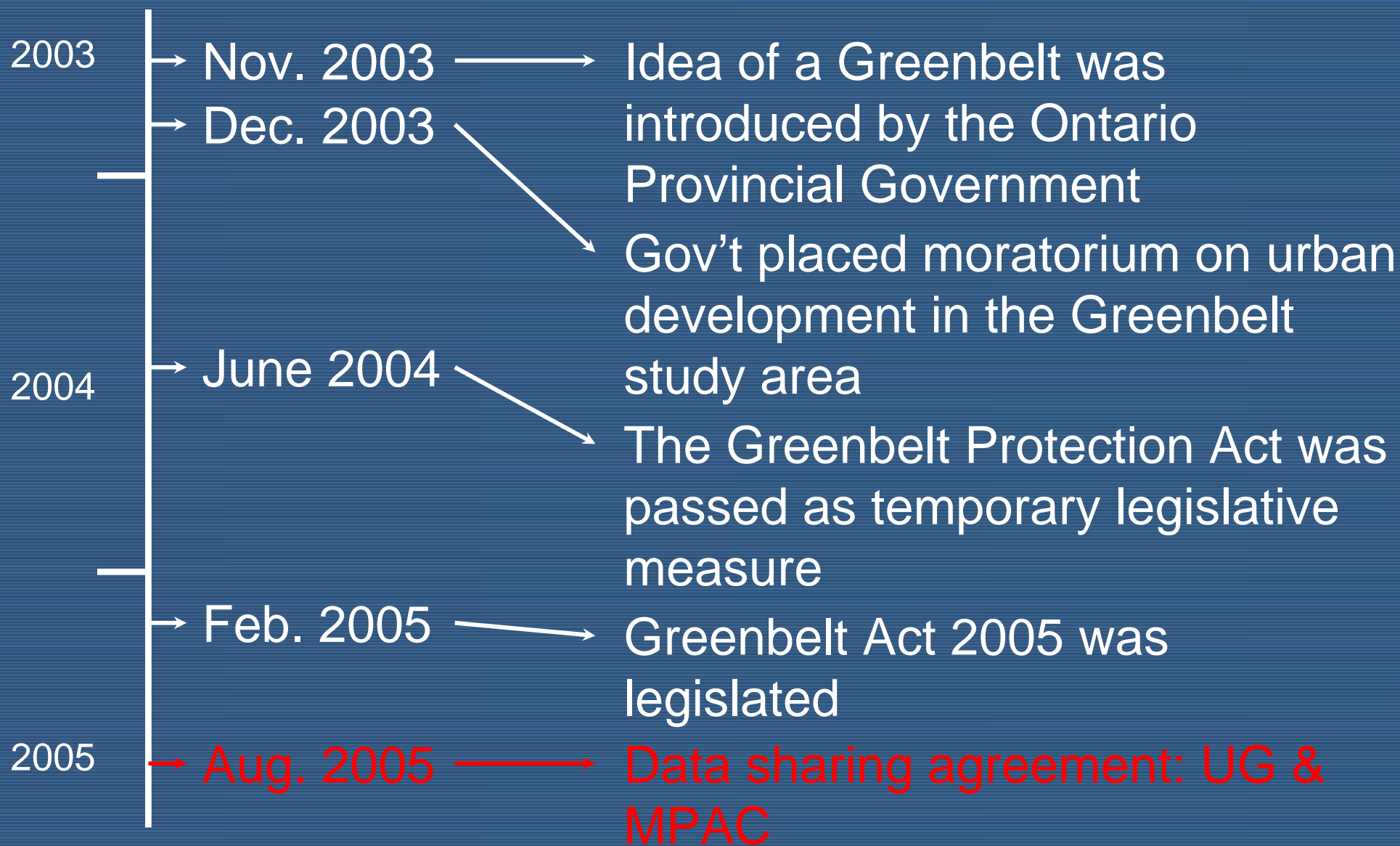
Niagara
Escarpment

Protected
Countryside

Oak Ridges
Moraine



Greenbelt Background



Greenbelt Research Question

- Has Greenbelt Legislation influenced farmland values?
 - The Ontario Ministry of Municipal Affairs and Housing says “no”
 - “The value of agricultural lands in the Golden Horseshoe that are not ...zoned for urban development ... should not be effected.” *
 - Some farmers believe values will decrease
 - Economic literature is mixed

* <<http://mah.gov.on.ca/userfiles/html/nts_1_23407_1.html>>

Previous Zoning Studies

- Vaillancourt and Monty (1985)
 - Zoning reduced the relative value of restricted use land
- *Henneberry & Barrows (1990)*
 - *Effects can be positive or negative: depends on parcel size, distance from urban area, development potential*
- Nickerson and Lynch (2001)
 - *Little statistical evidence that preservation programs decrease farmland prices*

Land Value Model (Brueckner, 1990)

$$V_a(t, t^*, x) = \int_0^{t^*} r_a e^{-it} dt + \int_{t^*}^{\infty} r_u(t, x, P(t)) e^{-it} dt - C e^{-it^*}$$

V_a = value of agricultural land

t = time

t^* = optimal conversion time

x = location of land

r_a = agricultural rent

i = discount rate

r_u = urban rent

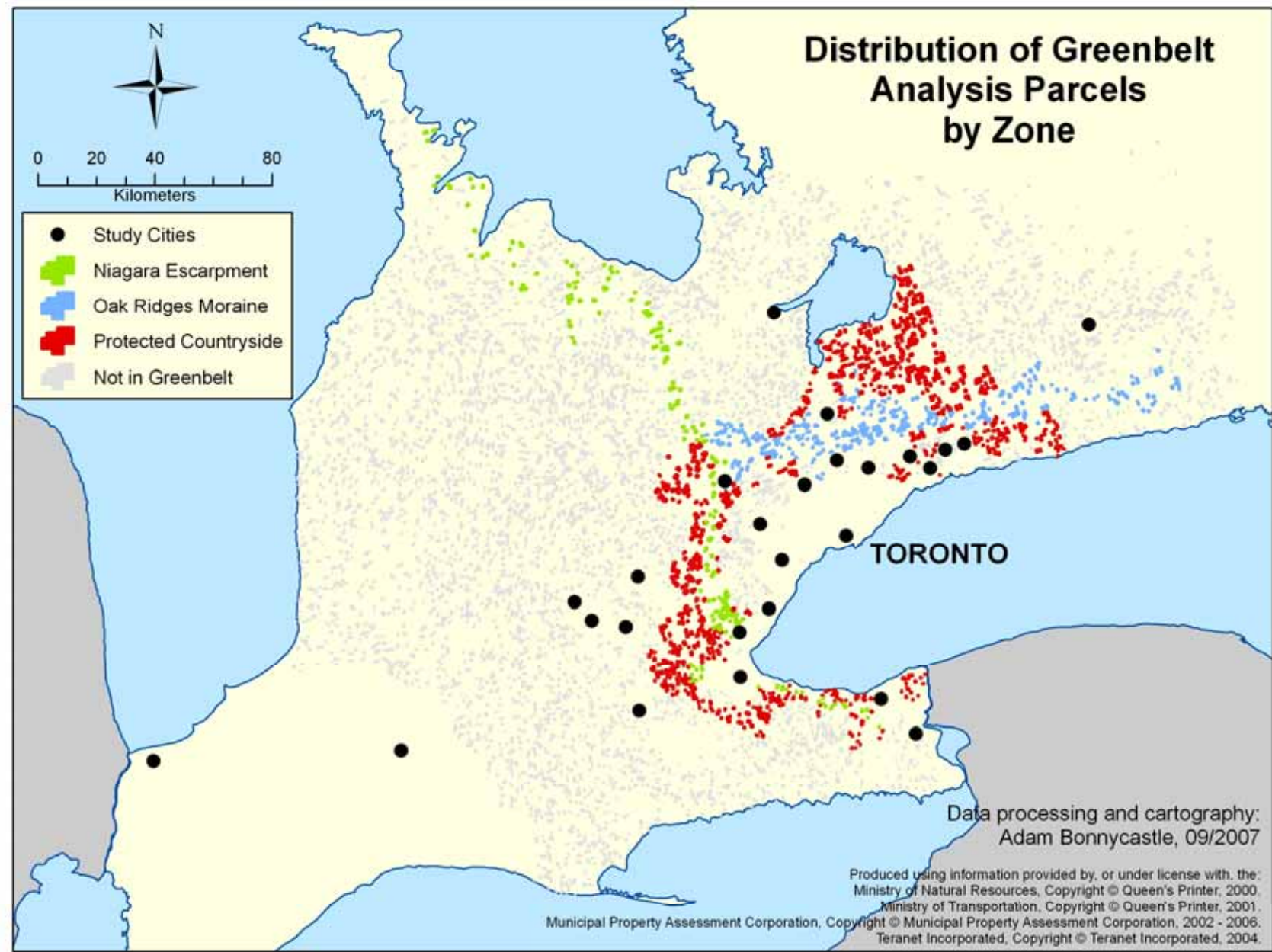
P = population

C = conversion costs

- Land will be converted if urban rent is greater than agricultural rent plus opportunity cost of capital for conversion

Data

- Time period: 2002 – 2006
- 7,762 sales of agricultural parcels from 21 counties in southern Ontario
- 1,633 sales in the Greenbelt



Sale Price Data (\$/acre)

	Cdn/US\$	Euros
• Mean:	\$14,054	€19,676
• Median:	\$5,084	€7,118
• St. Dev.:	\$31,818	€44,545

Empirical Approach

- Hedonic Pricing Model

$$P_{ij} = (S_i, Q_i, A_i, L_i, G_i)$$

Structural

Land Quality

Amenity/Neighbourhood

Location/Spatial

Greenbelt

Sales Price of Property (Cdn\$/acre)

SAR Model

$$y = \rho Wy + X\beta + \varepsilon$$

y = sale price per acre

ρ = *spatial correlation parameter*

W = *spatial weight matrix – based on 15 nearest neighbours*

X = {

- Greenbelt variables*
- Structural variables*
- Land quality variables*
- Neighbourhood/amenity variables*
- Location variables*

Greenbelt Temporal Issues

- November 2003 – the idea of a Greenbelt is first publicly announced
 - Prior to Nov. 2003: Pre-Greenbelt period
- June 2004 – Greenbelt Protection Act
 - Nov. 2003 to June 2004: Intermediate period
 - After June 2004: Post-Greenbelt period

Greenbelt Spatial Issues

- Three zones within the Greenbelt
 - Protected Countryside (PC)
 - Oak Ridges Moraine (ORM)
 - Niagara Escarpment (NE)
- Two zones (ORM & NE) had previously protected land to some degree
- Effects are expected to be more evident in the PC

Greenbelt Variables

- **GB** = 1 if parcel is located in the Protected Countryside zone of the Greenbelt
- **GB intermediate** = 1 if parcel is located in the Protected Countryside and sold between November 2003 and June 2004
- **Post-GB** = 1 if parcel is located in the Protected Countryside and sold after June 2004
- **Post-GB X In(GTA)** - Interaction term between distance to the GTA and parcels in the PC sold after June 2004

Greenbelt Variables

- Post-GB = 1 if parcel is located in the Protected Countryside and sold after June 2004
- Post-GB X $\ln(\text{GTA})$ Interaction term between distance to the GTA and parcels in the PC sold after June 2004

Results

Greenbelt Variables	Coefficient	Std Error
GB	-0.2109 ***	0.0337
GB intermediate	0.0112	0.0408
Post-GB	-0.2208 ***	0.0678
Post-GB X ln(GTA)	0.0728 ***	0.0239
Number of Observations	5631	
R-squared	0.8667	

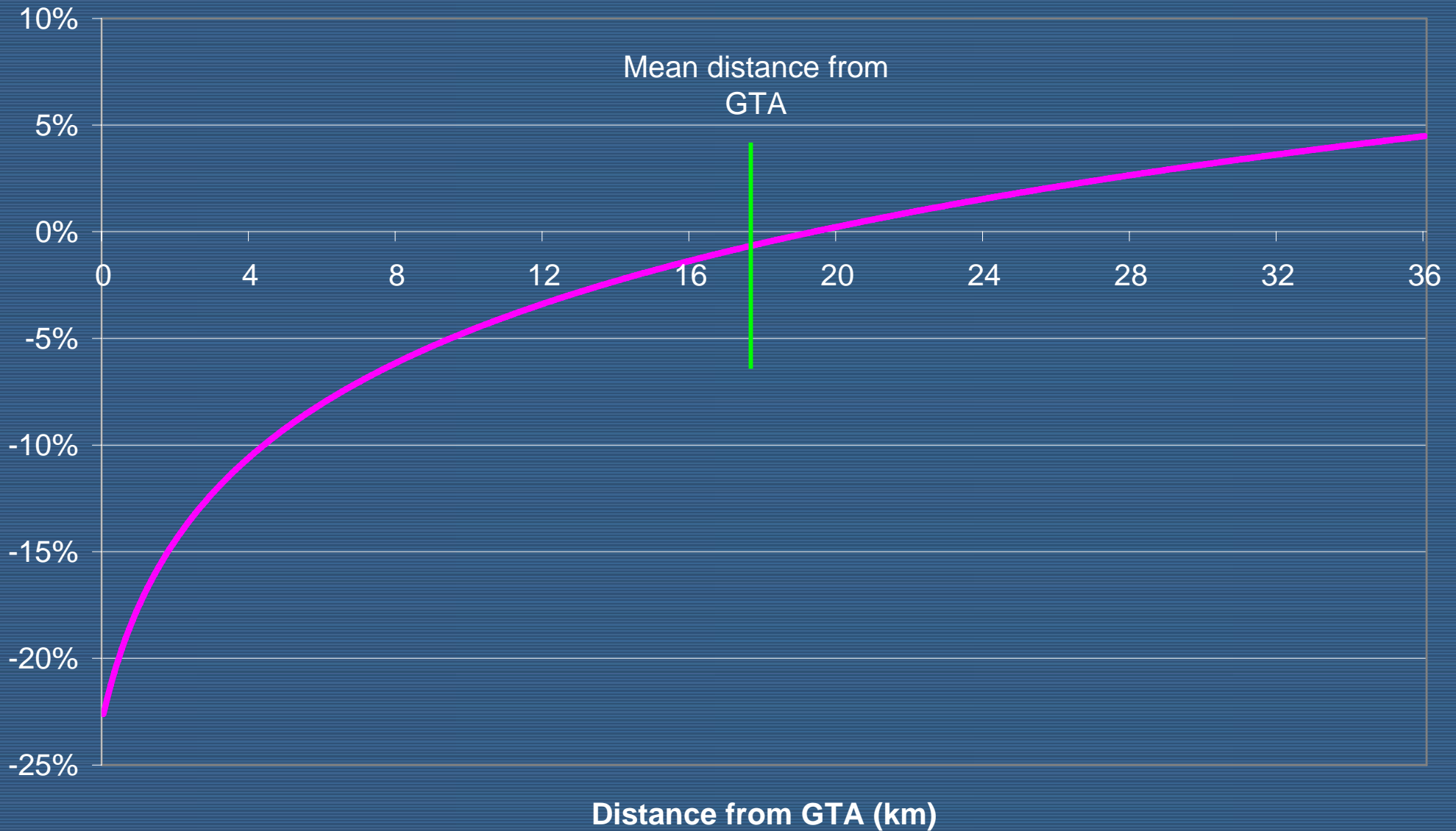
Asterisks (*, **, ***) indicate significance at the 10%, 5% and 1% levels, respectively

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Spatial Distribution of Greenbelt Effects



Spatial Effects

- Significant spatial correlation exists
- Spatial correlation parameter

$$\rho = 0.3506$$

Implications

- Greenbelt legislation has negative effects on prices of farmland close to the GTA
 - These effects decline with distance from the GTA
- Effects on farmland in the PC at the edge of the GTA
 - 20% decrease in price
- Effects on farmland in the PC at the mean distance from the GTA
 - 1% decrease in price

Implications

- Zoning affects farmland property values
- Effect varies depending on development pressure

Future Research

- Leapfrog effect - ongoing
 - Test for effects of the Greenbelt legislation just outside the outer Greenbelt boundary
- Adjust for lag between sale and closing date
- Effects of legislation on rural residential properties

Thank you for your attention.
Any questions?