

# A Spatial Analysis on the Impacts of Mass Transit Improvements on Residential Land Values in the Bangkok Metropolitan Region

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GIS Day

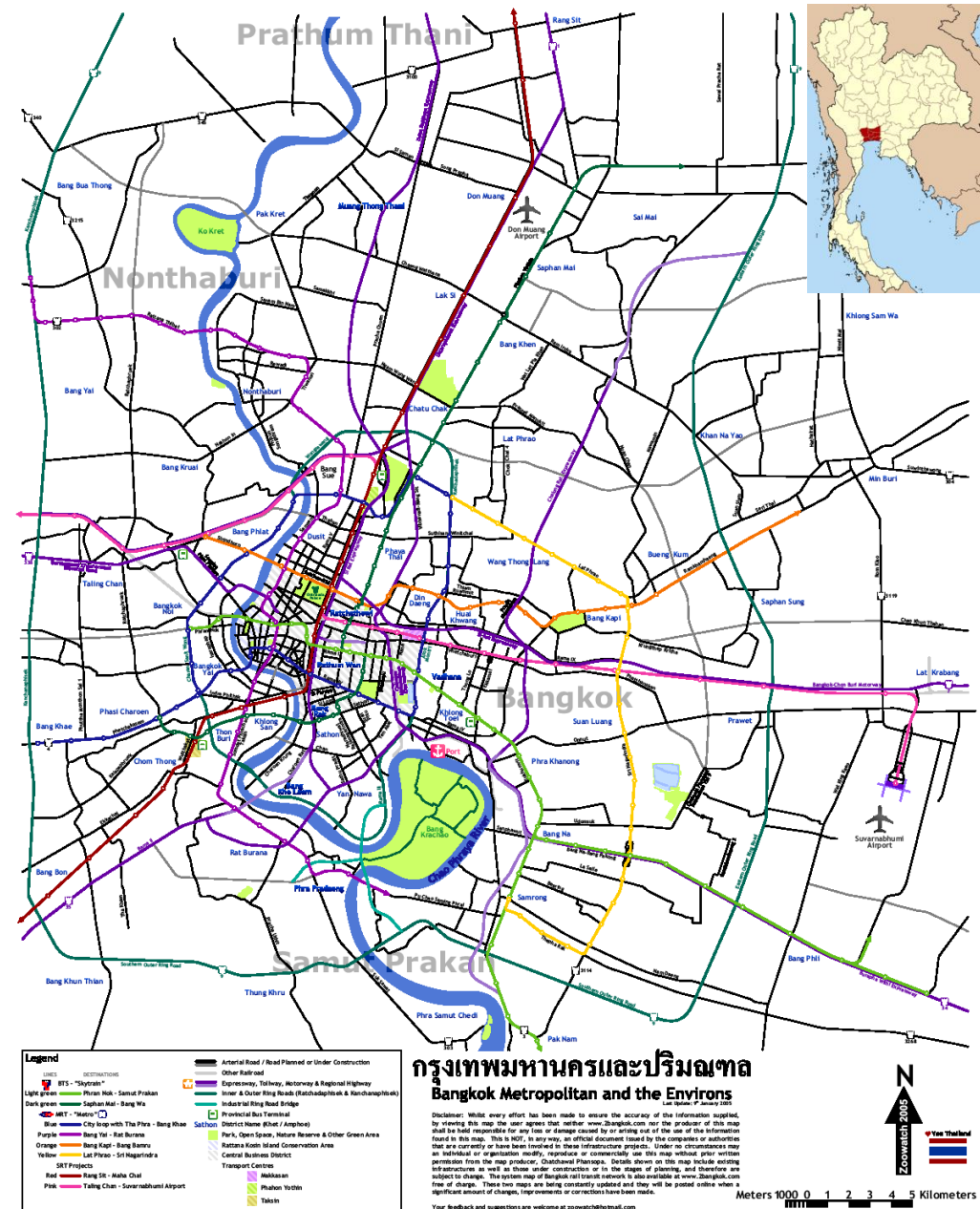
November 10, 2010

## Introduction:

### Bangkok Metropolitan Region:

Province	Area (km <sup>2</sup> )	Population
Bangkok	1,568.74	6,355,144
Nonthaburi	622.3	1,060,320
Samut Prakan	1,004.50	1,152,107
Pathum Thani	1,525.90	937,224
Samut Sakhon	872.3	480,998
Nakhon Pathom	2,168.30	845,769
<b>Total</b>	<b>7,762.04</b>	<b>10,831,562</b>

16% of Thai Population  
Density: 1,395 inhabitants/km<sup>2</sup>



Source:  
[http://en.wikipedia.org/wiki/Bangkok\\_Metropolitan\\_Region](http://en.wikipedia.org/wiki/Bangkok_Metropolitan_Region)

# Introduction:

- Severe traffic problems



# Introduction:

- Mass Transit Systems



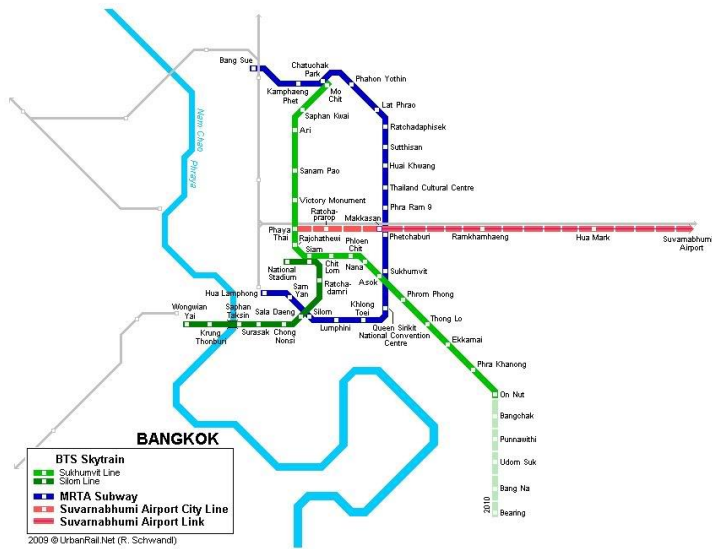
BTS Skytrain  
(1999)

MRT Subway  
(2004)

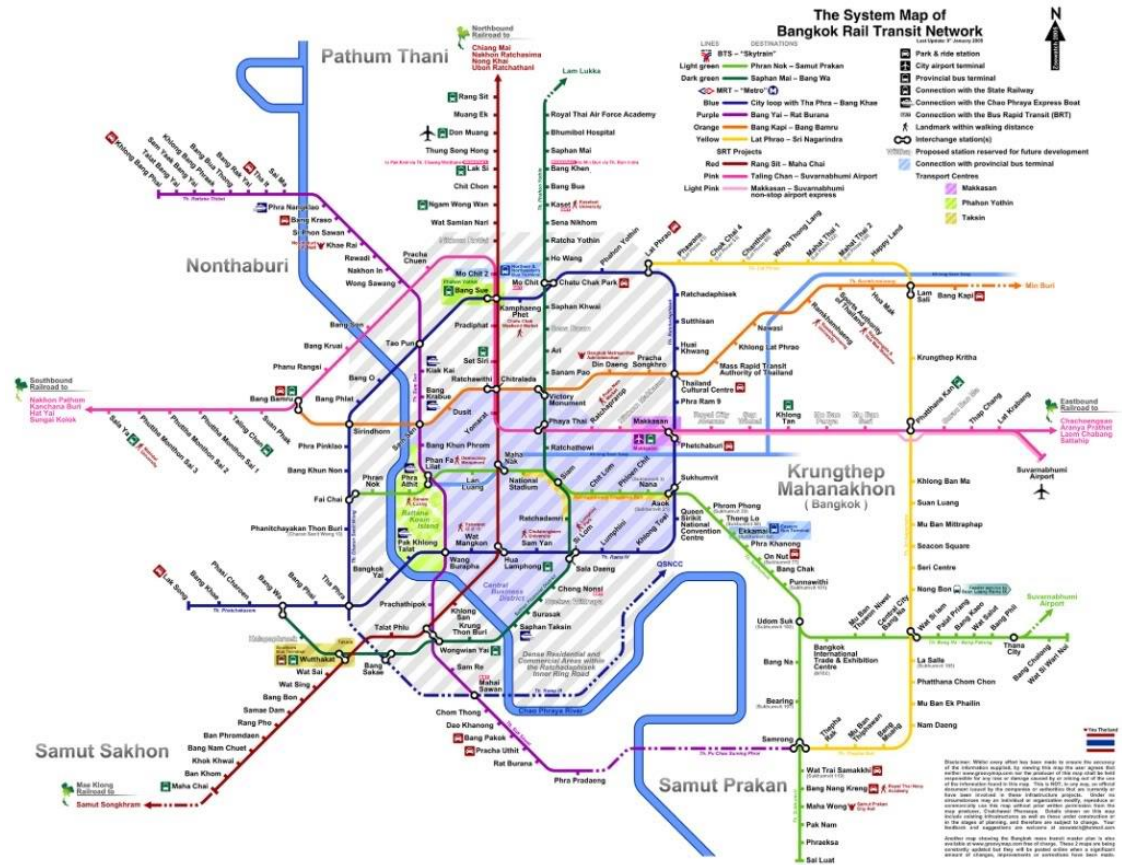
Airport Link  
(Aug 2010)

## Introduction:

- Effect of Mass Transit to land prices and urban structure



2010



2050

## Methodology:

Three modelling approaches are used:

1. Ordinary Least Square (OLS) Model

$$Y = X\beta + \epsilon$$

2. Spatial Lag Model

$$Y = \rho WY + X\beta + \epsilon, \epsilon \sim N(0, \delta^2 I)$$

3. Spatial Errors Model

$$Y = X\beta + \lambda W\xi + \epsilon, \epsilon \sim N(0, \delta^2 I)$$

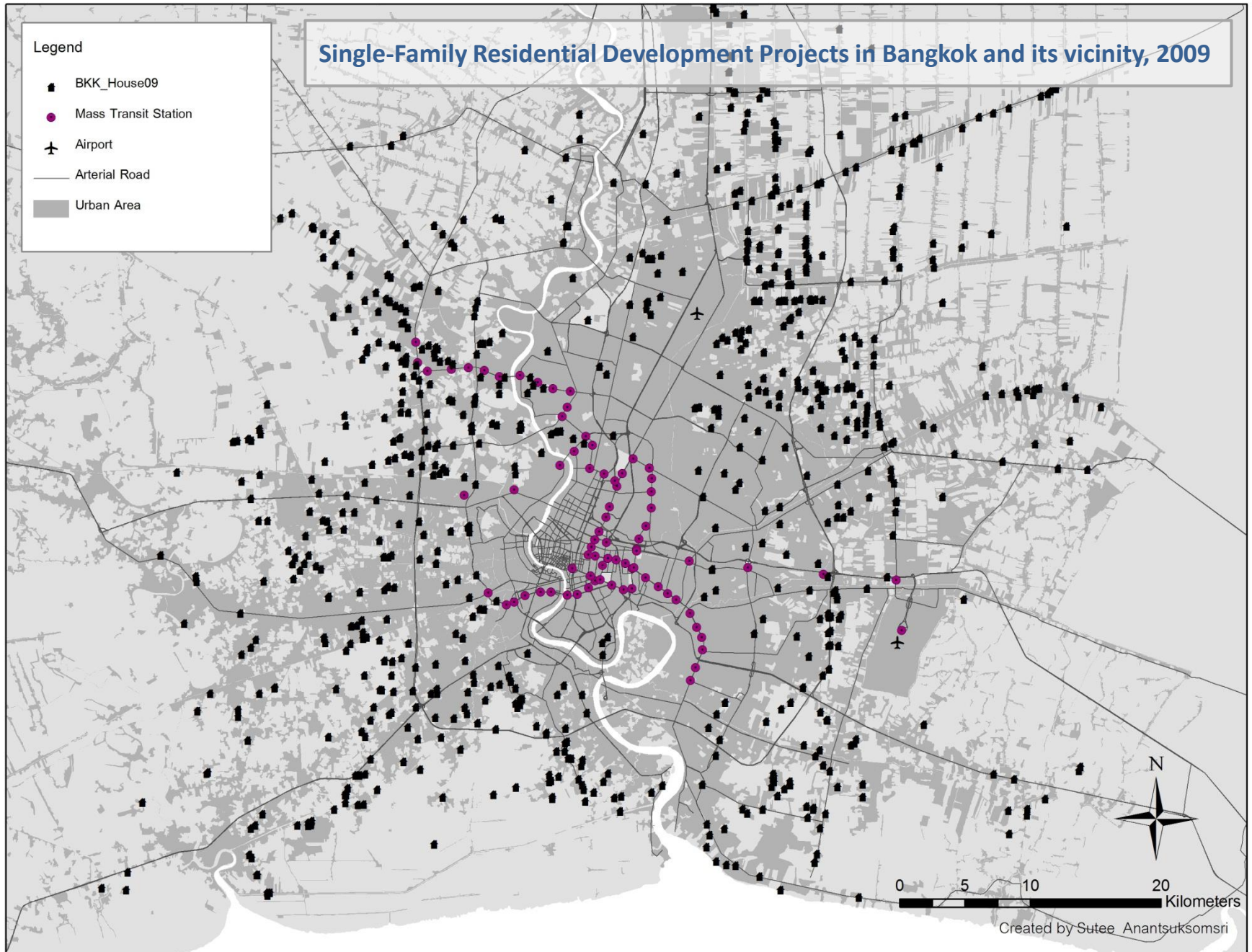
# Methodology:

The hedonic regression:

$$Y = \beta_0 + \beta_i X_i + \varepsilon$$

- The dependent variable is a **land price** of observed land parcel.
- The independent variables are:
  - Housing Density
  - Population Density
  - Distances from existing and proposed stations
  - Distances from central business district (CBD)
  - Distances from arterial roads
  - Distances from top schools
  - Distances from universities
  - Distances from hospitals
  - Distances from shopping centers
  - Distances from parks

# Spatial Analysis of Mass Transit and Land Values in Bangkok Metropolitan Region





## Conclusion:

- The mass transit improvements have been contributable to an increase in values of residential land price.
- A price per sq.wah (4 sq.m.) of land decreases at roughly 0.32 Baht (US\$ 0.01) for an additional metre away from a transit station.
- A price per sq.wah of land discounts of approximately 0.04% for a percent increase in the distance away from a station.

**Thank you**