

FIG

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A Concept of Land Administration Tool against City Sprawl

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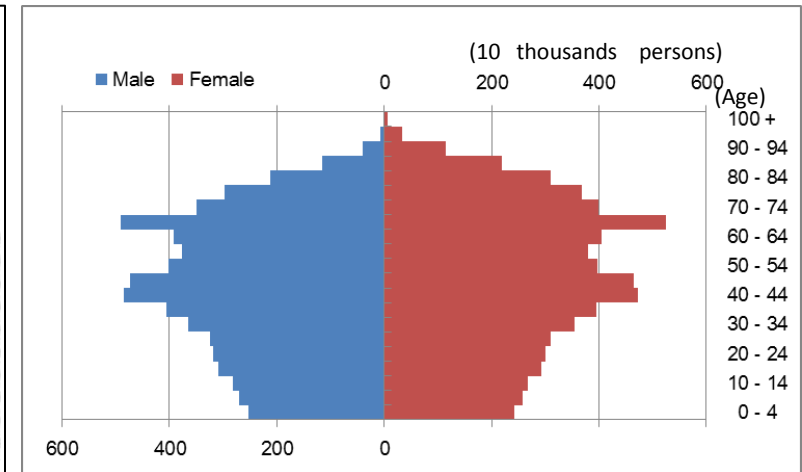
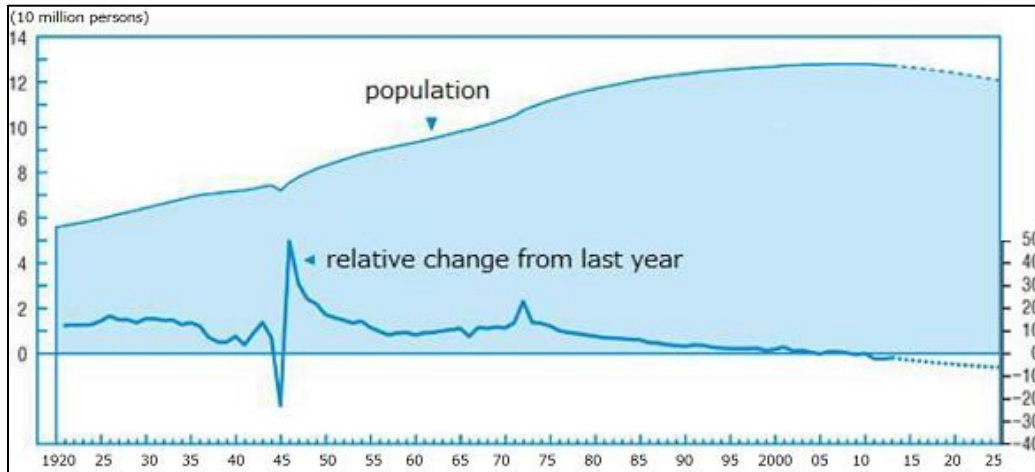
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2. Our Data Model under Development
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Introduction

Recent Demographic Change in Japan



The current situation of the Japanese population:

- birthrate decline
 - population aging
 - shrinkage of the productive population
- ⇒ decreasing tax revenue

Introduction

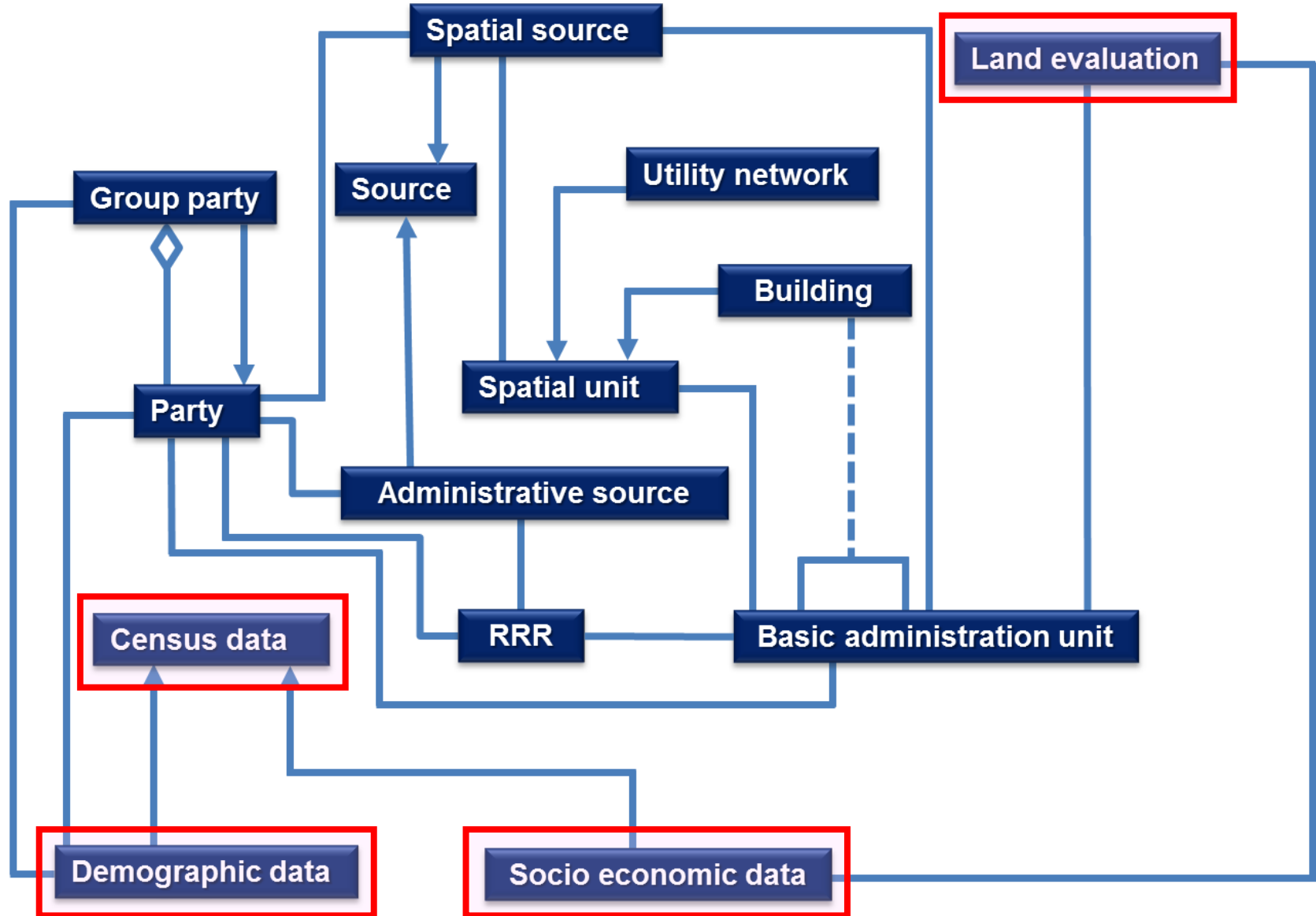
Motivation

- Municipal government must achieve high efficiency.
- City Sprawl under depopulation = Lowering efficiency

We, surveyors assist them through:

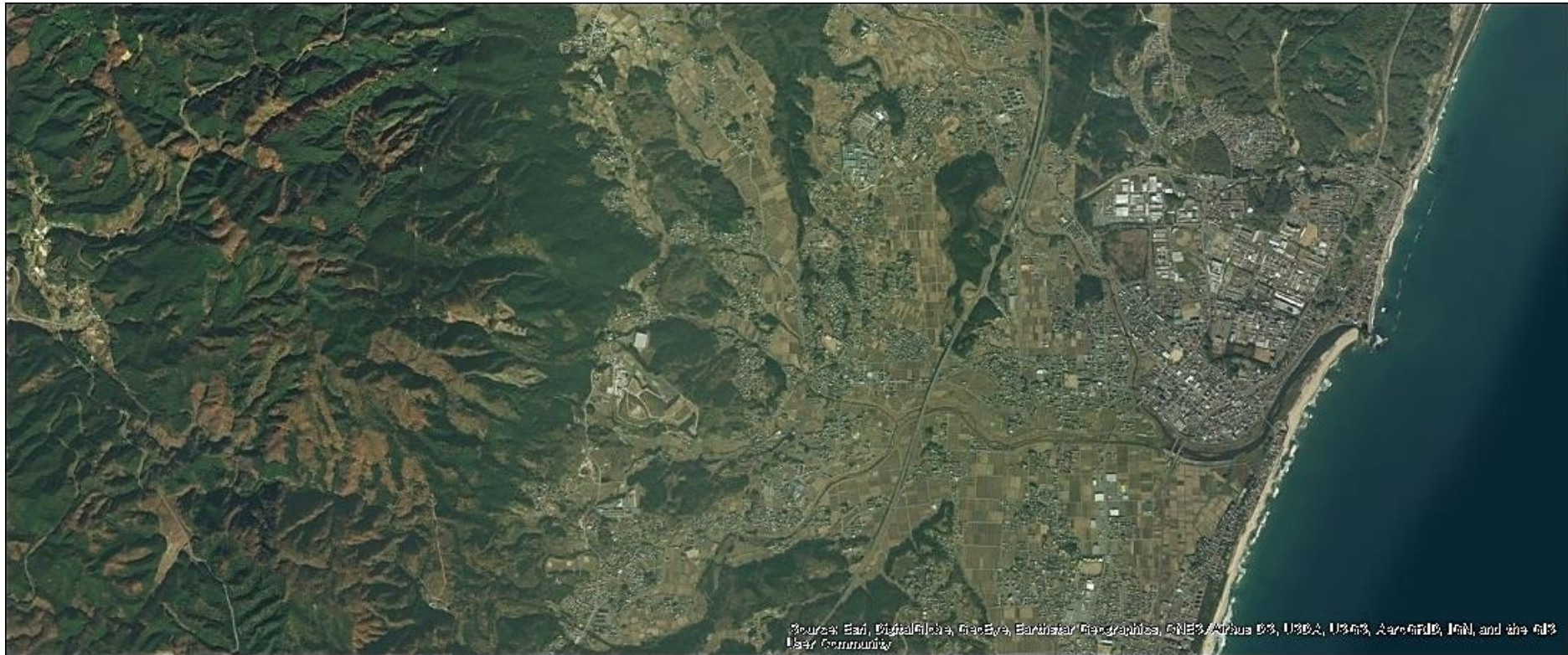
- development of conceptual design of the land administration GIS tool against city sprawl
- planners to communicate with the residents by utilizing the tools
- Residents can participate in planning land management process

Our Data Model under Development



System under Development

- (1) Using only available official data
- Population change
 - Land evaluation
 - Cadaster
- (2) Case study in a real typical Japanese small city, with coastal, mountain, urban, agricultural, residential, and industrial areas, and having tracks and stations.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Fig.3 Part of the study area

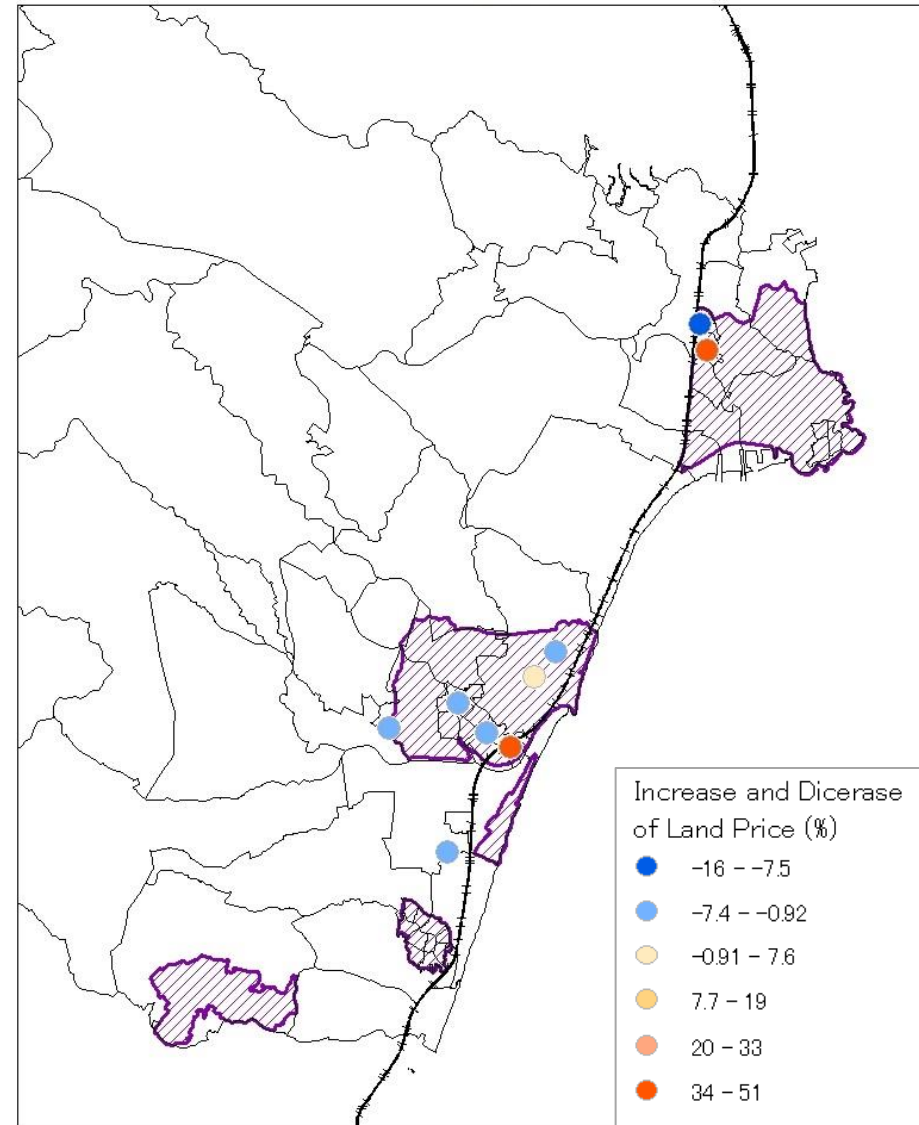
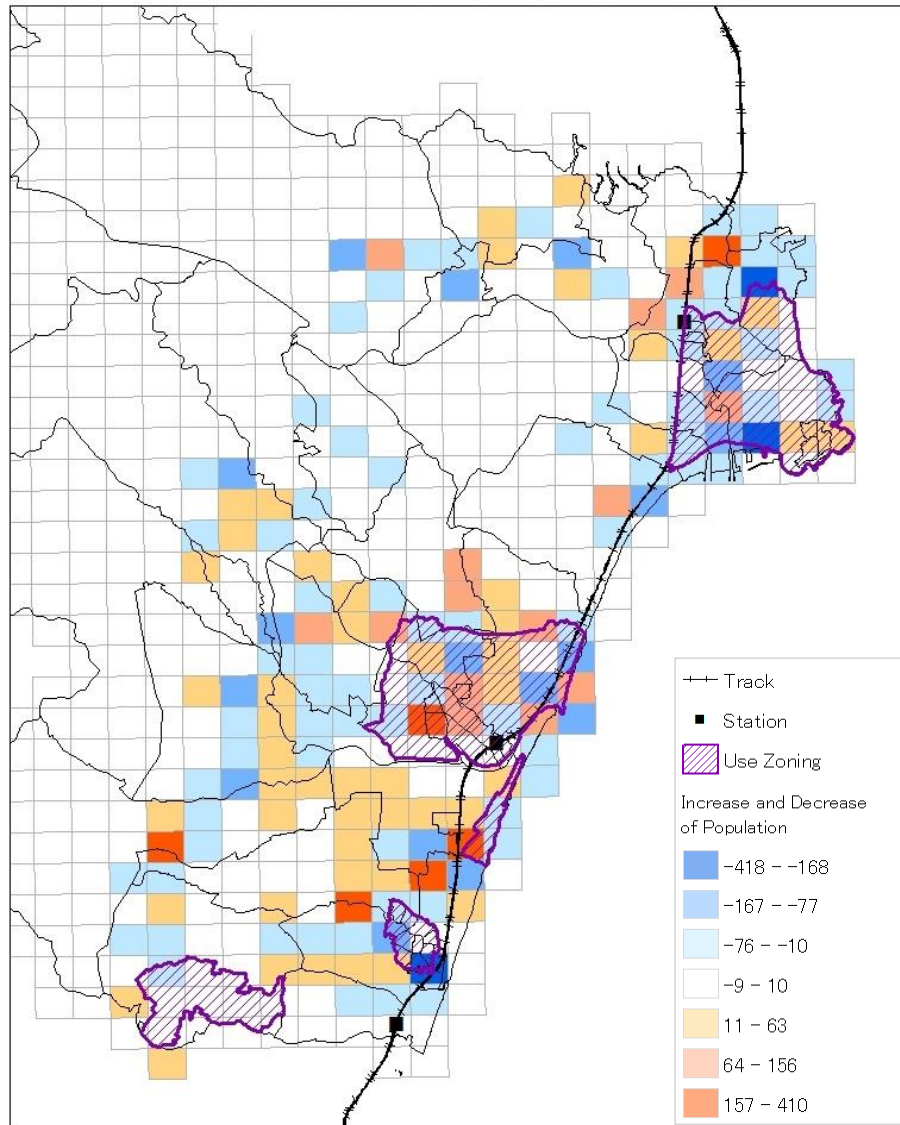
(REF: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community)

System under Development

Population and Land Price Change (1995-2010)

Population Change (1995-2000)

Land Price Change (1995-2000)

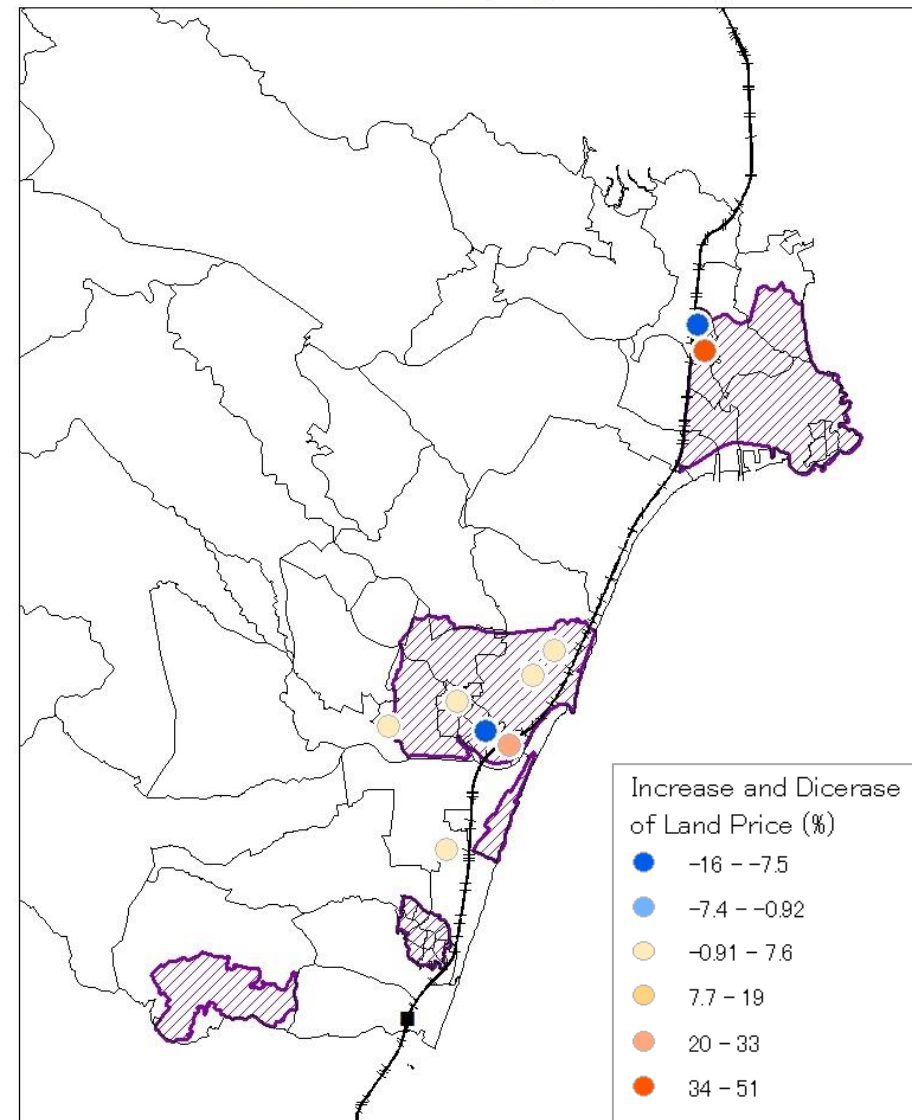
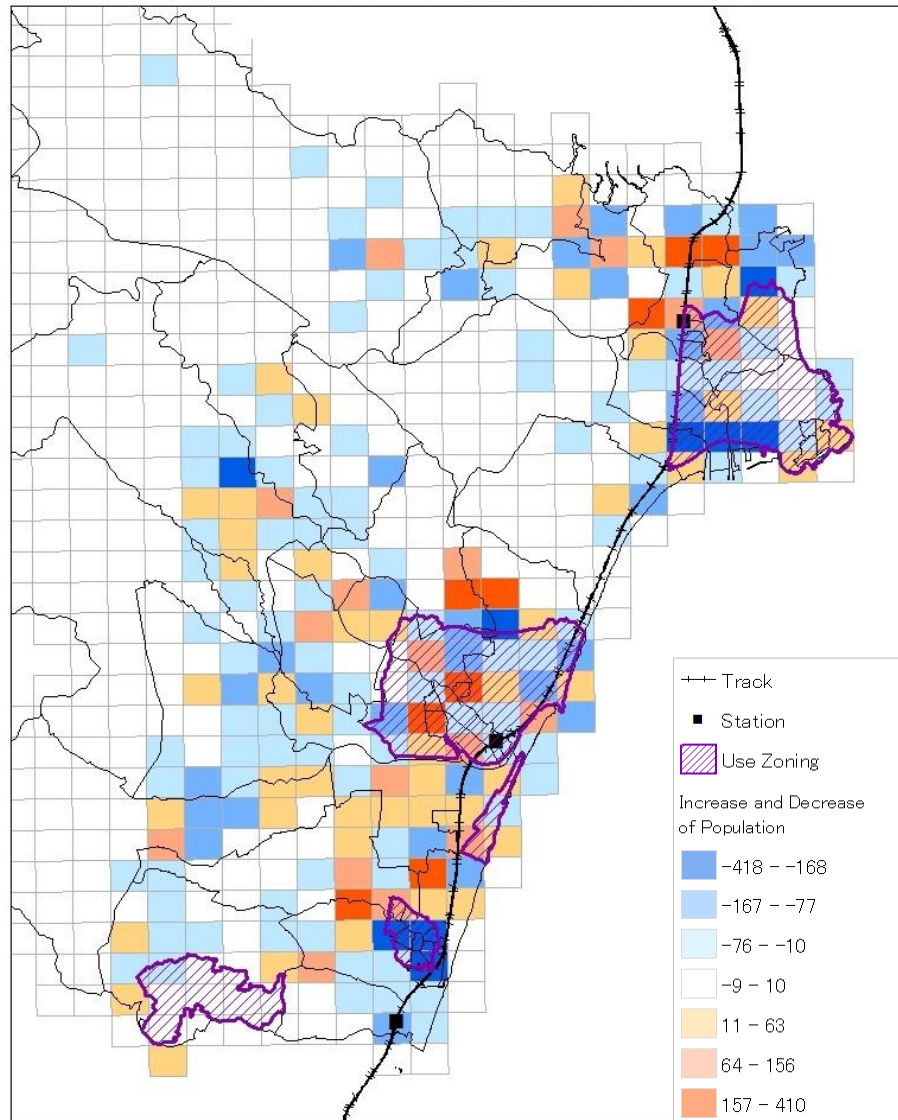


System under Development

Population and Land Price Change (1995-2010)

Population Change (1995-2005)

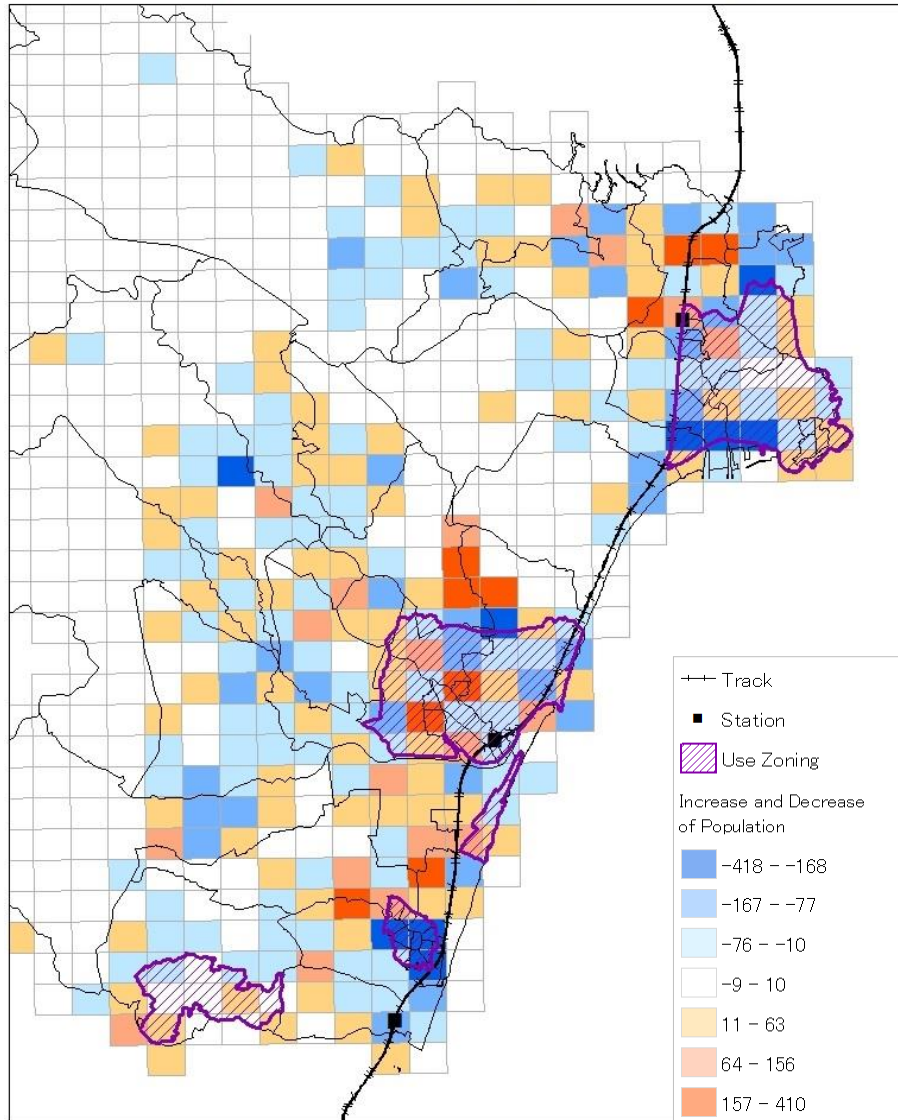
Land Price Change (1995-2005)



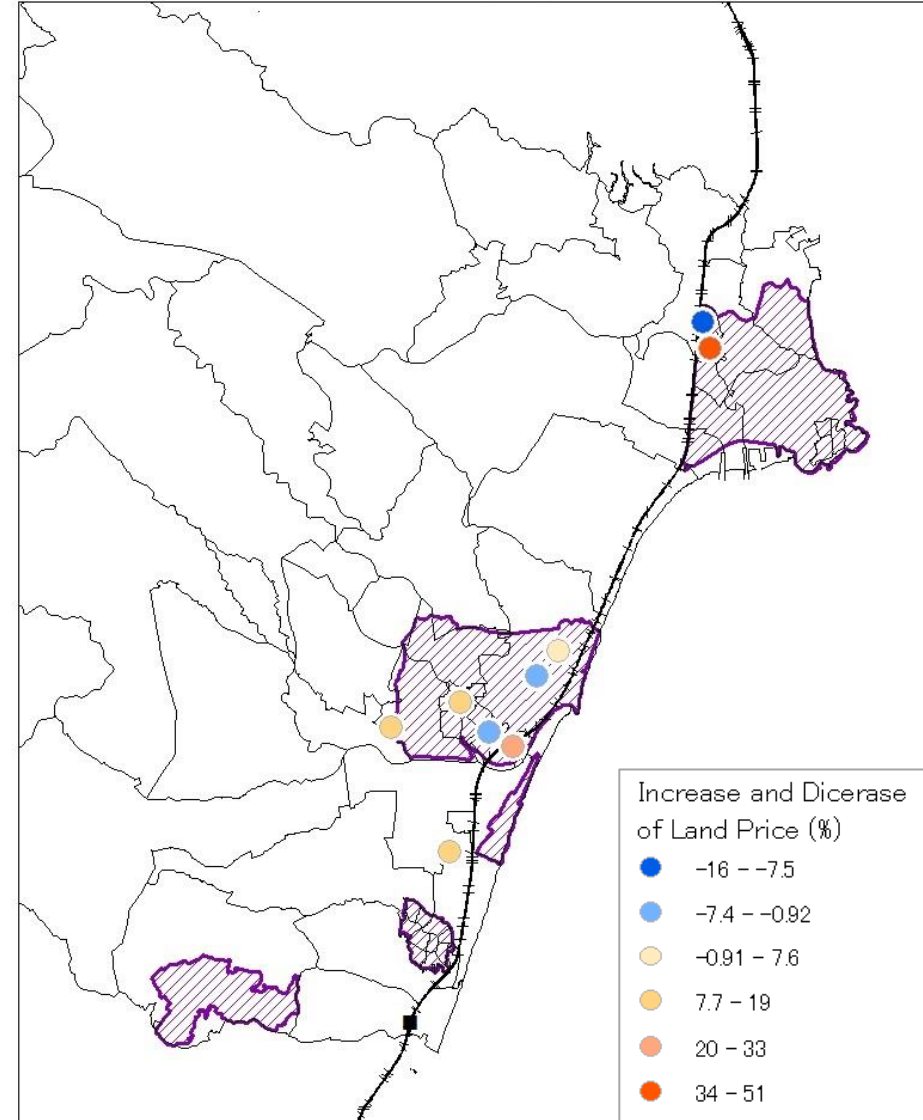
System under Development

Population and Land Price Change (1995-2010)

Population Change (1995-2010)



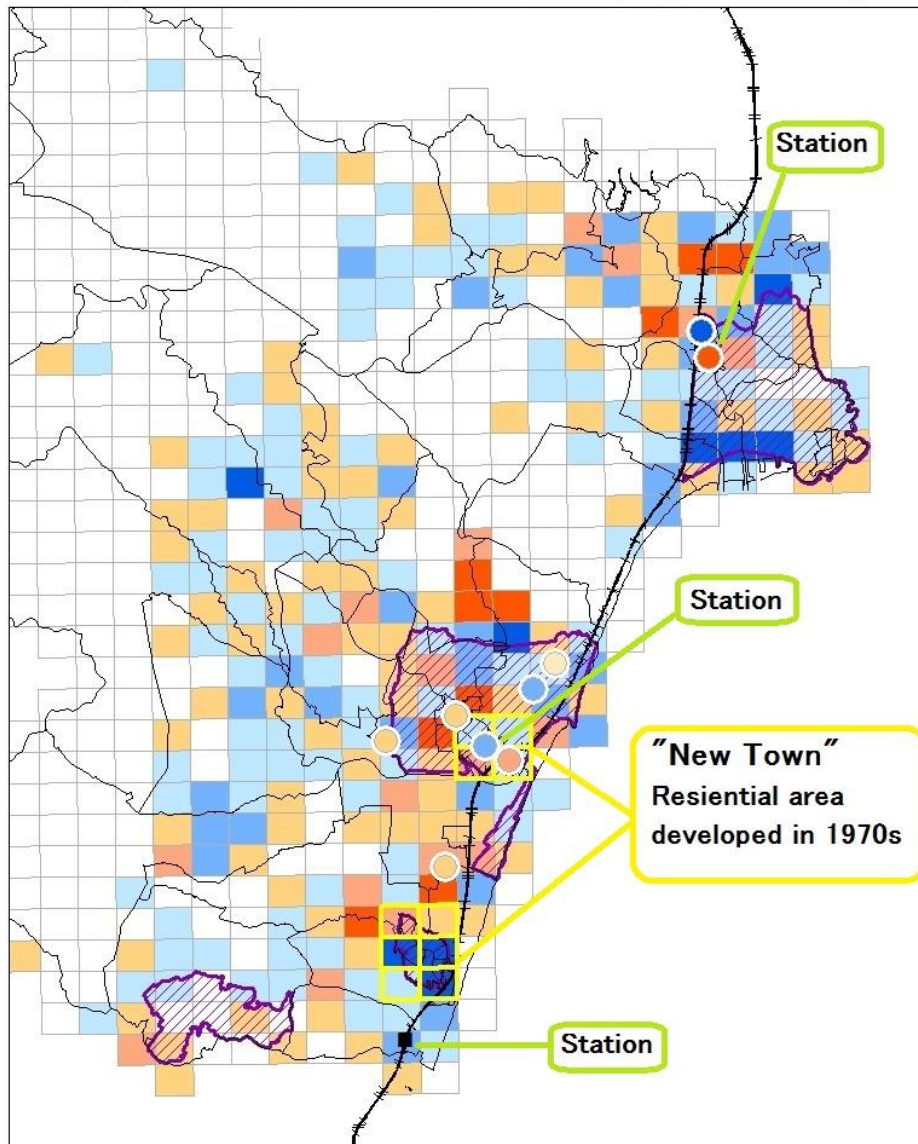
Land Price Change (1995-2010)



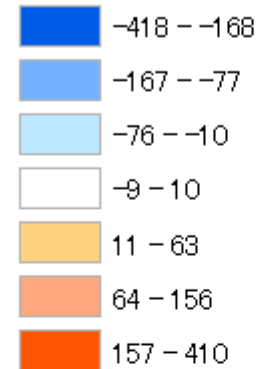
System under Development

Situation of City Sprawl in 2010

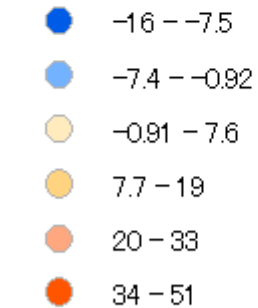
Population and Land Price Change (1995-2010)



Increase and Decrease of Population (persons)



Increase and Decrease of Land Price (%)



---+--- Track

■ Station

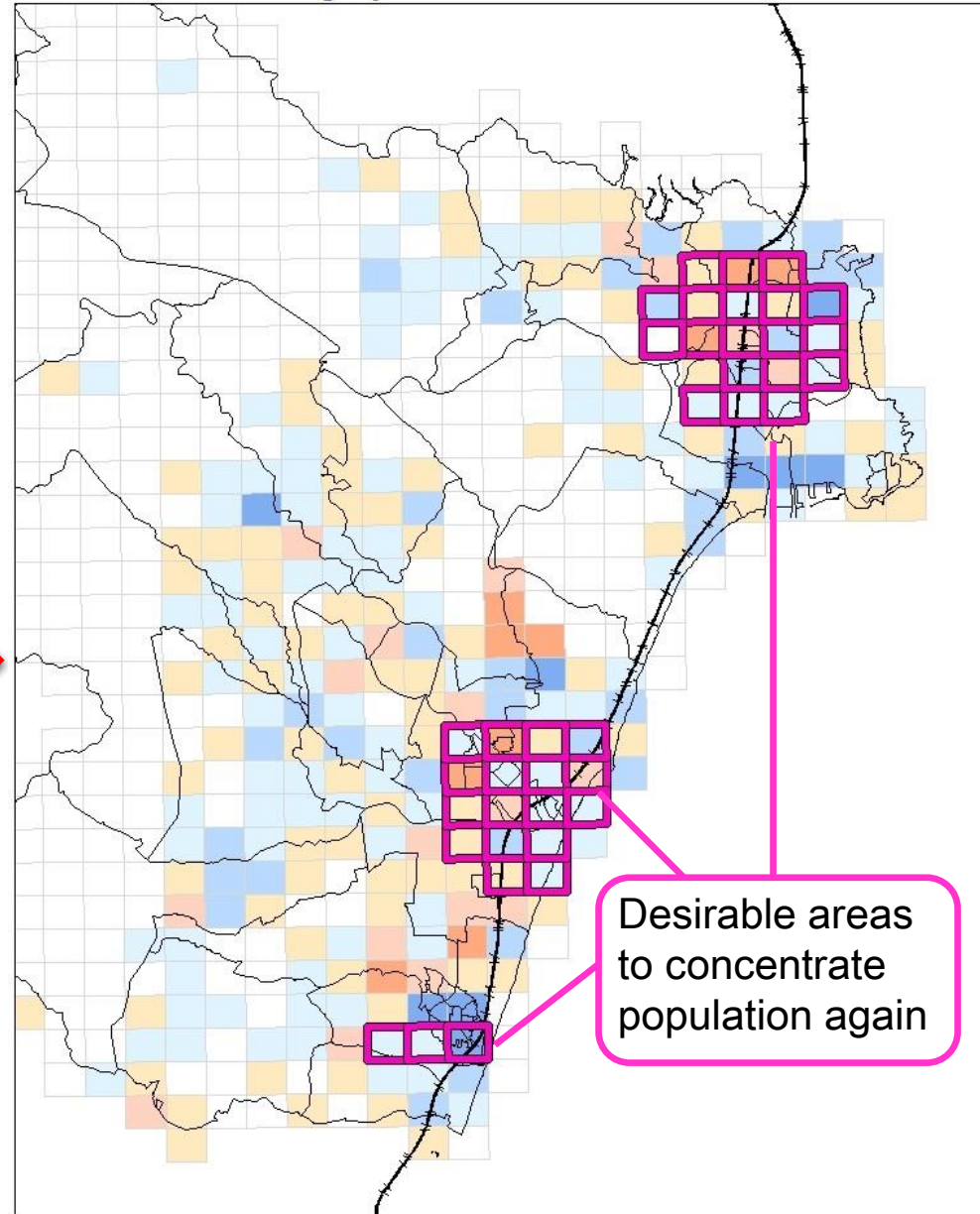
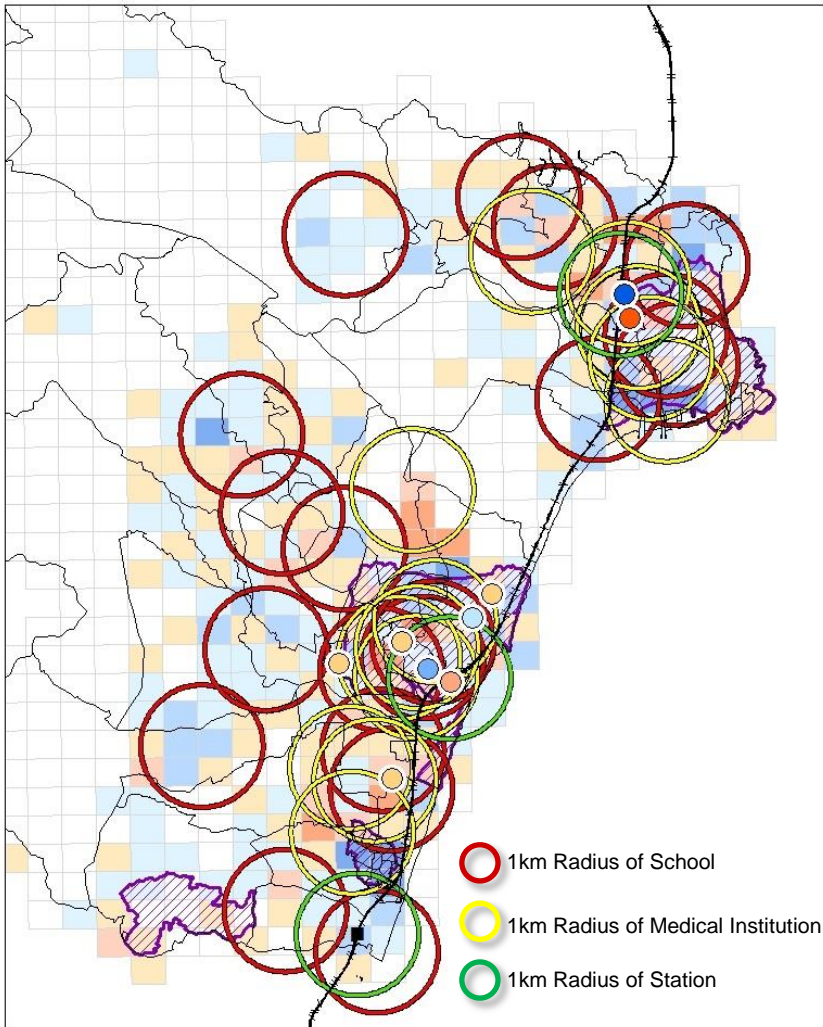
▨ Use Zoning

System under Development

Convenience Index

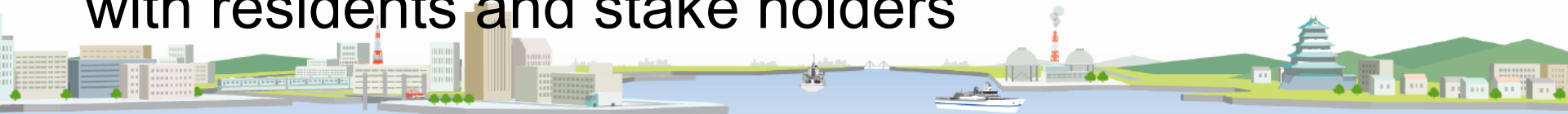
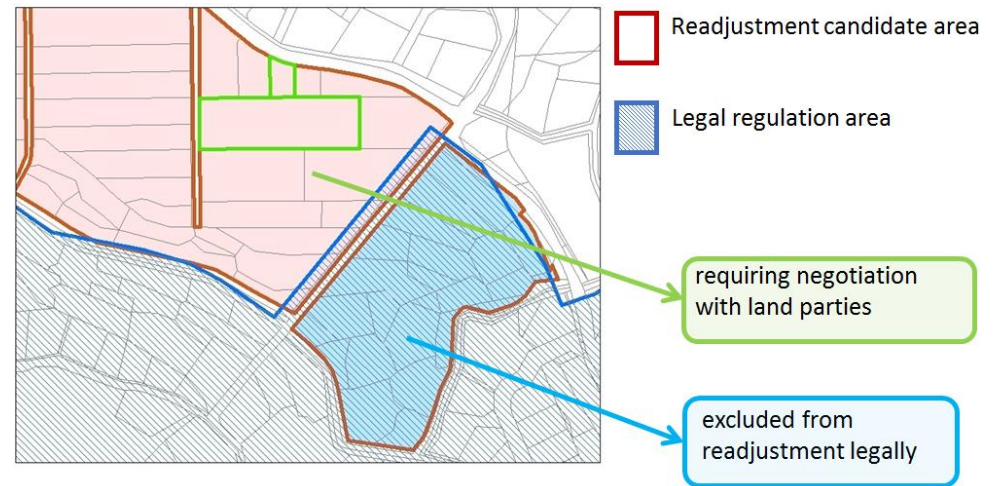
Highly Convenient District

1km Radius of Station, Medical Institution, and School



Conclusion

- Macro approach made visible the relation between city sprawl and land price.
- Micro analysis can be achieved through original cadaster data, which enables municipalities and communities to consider city plan suitable for declining population.
- GIS tool is quite useful for officers to communicate with residents and stake holders



Thank You for you kind attention!



← Sprawling residential area

“New Town”
Original planned residential area →



An aerial photograph of a city, likely New York City, showing a dense grid of streets, a river (the Hudson River) on the right, and several large green parks (Central Park and others) in the center and left. The image is used as a background for the text.

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Photographed by PASCO

Future Work: Required Tool Functions

■ Planning functions:

- simulating land management's effect
- merging quantitative and qualitative data
- calculating an actual index of selecting the area to attract population

with data taken from many DBs in the municipalities under a high security environment.

- ⇒ Final purpose: pursuing compact city policies to create sustainable cities and regions.

Future work: Customizability

- Considering the tool to use in area with not enough official data

Referring: the STDM

Collecting unofficial data, actual situation of land use

- And, considering to use the tool under countries and regions in the population growing to make residents move to suburban area premeditatedly.